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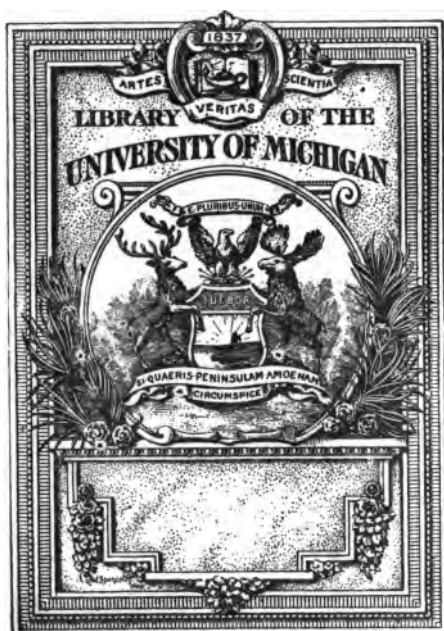
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The
American Association
of Medical Milk
Commissions

Proceedings of the
THIRD ANNUAL SESSION
Atlantic City, June 7
... 1909 ...



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PROCEEDINGS
OF THE
Third Annual Conference
OF THE
American Association
OF
Medical Milk Commissions

HELD AT THE
ST. CHARLES HOTEL
Atlantic City, New Jersey.
Monday, June 7, 1909.

CINCINNATI, O.

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OFFICERS 1909-1910.

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SECRETARY.

Dr. Otto P. Geier.....124 Garfield Place, Cincinnati O.

TREASURER.

Dr. A. W. Myers.....141 Wisconsin St., Milwaukee, Wis.

COUNCIL.

Dr. Henry Enos Tuley, *Chairman*111 W. Kentucky St., Louisville, Ky.

Dr. Otto P. Geier, *Secretary*.....124 Garfield Place, Cincinnati, O.

Dr. Henry L. Coit.....277 Mt. Prospect Ave., Newark, N. J.

Dr. Samuel McC. Hamill.....1822 Spruce St., Philadelphia, Pa.

Dr. C. W. M. Brown.....311 Baldwin St., Elmira, N. Y.

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Dr. Ogden M. Edwards, Jr.....5607 Fifth Ave., Pittsburgh, Pa.

STANDING COMMITTEES.

MEDICAL EXAMINATIONS OF EMPLOYEES.

Dr. W. H. Park, New York City. Dr. Thomas Harvey, Orange, N. J.

Dr. M. J. Rosenau, Washington, D.C. Dr. Alfred Hand, Philadelphia Pa.

CHEMICAL STANDARDS.

Dr. D. L. Edsall, Philadelphia, Pa. Dr. L. L. Van Slyke, Geneva, N. Y.

Dr. Henry Dwight Chapin, New York City.

BACTERIOLOGICAL STANDARDS.

Dr. M. J. Rosenau, Washington, D.C. Prof. W. A. Stocking, Cornell University, Ithaca.

Mr. H. A. Harding, N. Y. Sta. Exp. Sta., Geneva, N. Y. Dr. M. P. Ravenel, University of Wisconsin, Madison, Wis.

Dr. W. H. Park, New York City. Dr. Francis H. Slack, Boston, Mass.

Dr. Rowland G. Freeman, New York City. Prof. A. R. Ward, Berkeley, Cal.

VETERINARY INSPECTIONS AND PROTECTION AGAINST TUBERCULOSIS.

*Dr. Leonard Pearson, University of Pennsylvania, Philadelphia.

Dr. Samuel McC. Hamill, Philadelphia.

Prof. A. R. Ward, Berkeley, California.

STATISTICS OF MILK BORNE MORBIDITY AND MORTALITY, AND INFANTS' MILK CHARITIES.

Dr. Henry L. Coit, Chairman, Newark, N. J.

Dr. John W. Kerr, Washington, D. C.

Dr. Rowland G. Freeman, New York City, N. Y.

COMMITTEE OF COUNCIL.

ON PUBLICATION.

Dr. Henry L. Coit. Dr. Henry Enos Tuley.

Dr. Otto P. Geier.

*Deceased.

**The American Association of Medical Milk
Commissions.
Past and Present--What of the Future?**

IT is with just pride that our Association hands you herewith this volume which contains the transactions of the third annual conference of this Association. A review of its pages will disclose the happenings of a most interesting session, the papers of which indicate a proper conception of the purposes and aims of this Association. Other data herein contained shows the marvelous growth of the Medical Milk Commission idea during the past two years. After all, however, these pages but poorly reflect what a power for good this Association has been; what an influence it has had in shaping remedial legislation for the milk supply of many cities; how far reaching in its educational value to the profession; and lastly how valuable these conferences have been to our own membership.

The present enrollment of three hundred professional men who comprise the membership in the fifty-eight component Commissions, along with the fifty or more individual members, speaks loudly for the value of organization,—one needs but recall that a little over two years ago those most interested in Medical Milk Commission work knew of the existence of but twelve Commissions doing active work. Through the interchange of ideas at these conferences, the voluntary medical control and the production of **CERTIFIED** Milk has become a rather definite science. The methods of control have become standardized. Our committees, after thorough investigation, have brought in their reports as to the best technic to be used in the bacteriological control. The standards for the chemist have been brought forward. The field to be covered by the veterinarian has been definitely outlined. Each Commission has specific data by which the work of its three experts, bacteriologist, chemist and veterinarian, are to be judged. The question of the Medical Examination of Employees has been most fully discussed, and its value more broadly appreciated by our membership.

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Each community in which a Medical Milk Commission is at work has been benefited by the better understanding and deeper interest in the clean milk movement which has been so much accentuated by the growth of this Association. The Medical Milk Commission is recognized today as it never has been before. Three states, New York, Kentucky and New Jersey, give legal sanction to the use of the term CERTIFIED, and protect the public from the danger of its fraudulent use. Reference to the volume of the second proceedings will show that the state of New Jersey in its certified milk law, recognizes the standards of this Association. As an instance of the interest that the people outside of our Association are taking in our transactions, it may be said that each year several hundred of these volumes are bought by the Public Libraries and Colleges in the country. Numberless Health Officers are using our publications as a guide in their work, and so it may be said that we have more than fulfilled the purposes of the Association. We have not only "exchanged views and adopted uniform methods of procedure"—fostered and encouraged the establishment of Medical Milk Commissions in other cities, but the Milk Commissions have properly accepted the burden of leading the clean milk crusade in their respective cities. Milk Shows have proven themselves a valuable adjunct to the work of Medical Milk Commissions. The movement in certain localities has been strengthened by these exhibits. Quite a number of these have been held in the past year, and out of it has grown a demand that this Association has been unable to fulfill, viz:—that of material, charts, statistics, etc. This points likewise to another useful field of activity on the part of a paid secretary. It is difficult to approximate the good that has thus been accomplished, but how immeasurable the good, were this Association financially able to meet the obligations to society that have come with its growth. From the East, West, North and South come appeals for assistance, so that similar work might be intelligently begun in other communities. Under the present conditions only the most urgent requests can be taken care of, and those only in rather a haphazard way, since their number even then make great inroads upon the

Proceedings of the Third Annual Conference

time and energy of the officers of the Association, who would welcome relief from these self-imposed tasks.

An endowment plan, with a paid secretary, would spell a wonderful progress not only for this Association in its promotion of hundreds of new Milk Commissions, but the spread of the gospel of clean milk in thousands of communities in our land. This fact is doubly assured in that the federal authorities stand ready to lend their co-operation in the promotion of this work. The Dairy Divisions of the various states which have been appealed to by the Milk Commissions have shown this same disposition. Were these offices all lending their assistance in intelligent co-operation, directed through this Association, their power for the betterment of the milk supply of our cities would be overwhelming.

Much has been said of the gain that this Association has made in the past year. It is difficult to express the loss we have suffered through the death of Dr. Leonard Pearson, Dean of the Veterinary College of the University of Pennsylvania, which occurred September 20, 1909. Dr. Pearson was one of the pioneers in this field of activity, and was devoted to the work of this Association. His influence in his own state was very great, and his contributions to the problems of bovine tuberculosis will long be looked upon as authoritative. He did us a great honor by his co-operation, and his loss to us is a great one.

OTTO P. GEIER, Secretary.

PROGRAM—FIRST SESSION.

ADDRESS OF WELCOME BY THE PRESIDENT.

Report of Committee on Bacteriological Standards.

REPORTS OF COMMISSIONS SENDING DELEGATES.

- The Medical Milk Commission of Essex County, New Jersey.*
Medical Milk Commission of the County of New York.
Milk Commission of the Medical Society of the County of Kings, New York.
The Milk Commission of the Academy of Medicine, Cincinnati, Ohio.
Milk Commission of the Suffolk District Medical Society, Boston, Mass.
Milk Commission of the City of Cleveland, Ohio.
Milk Commission of the Syracuse Academy of Medicine, Syracuse, New York.
Milk Commission of the Allegheny County Medical Society, Pittsburg, Pa.
The Milk Commission of the Academy of Medicine, Columbus, Ohio.
The Milk Commission of the Academy of Medicine, Toronto, Canada.
Milk Commission of the San Francisco County Medical Society.
Milk Commission of the Passaic County Medical Society, New Jersey.
Milk Commission of the Indianapolis Medical Society, Indiana.
The Milk Commission of the Union County Medical Society, New Jersey.
Wheeling Certified Milk Commission, West Virginia.
Milk Commission of the Montgomery County Medical Society, Ohio.
Milk Commission of the Medical Society of the County of Albany, New York.
The St. Louis Pure Milk Commission.
Kansas City Pure Milk Commission.
-

SPECIAL COMMUNICATIONS.

- Canadian Medical Association Milk Commission,*
CHARLES J. HASTINGS, M. D.
Cooperation of the Department with the American Association of Medical Milk
Commissions.
MR. B. H. RAWL, Chief Dairy Division, U. S. Dept. of Agriculture.
-

REPORT OF COUNCIL.

- Report of the Committee appointed to confer with the Certified Milk Pro-*
ducers' Association of America.

ADJOURNMENT.

Proceedings of First Session.

Atlantic City, N. J., June 7, 1909.

The meeting was called to order at 10 A. M., by the President, Dr. Rowland G. Freeman, New York.

Dr. W. H. Park, New York, was elected as Secretary pro-tem, in the absence of Dr. Otto P. Geier, of Cincinnati.

Address of the President: Gentlemen: It gives me pleasure to welcome you to the Third Annual Meeting of the American Association of Medical Milk Commissions.

For some time previous to the organization of this Association, it had been felt that such a society could perform a useful work, and I think the development since our organization has proved that the society was needed, and that it is now doing for dairy hygiene in this country, a work that is not at all appreciated by the public. The only evidence I need give you of this fact is that two years ago there were but eleven milk commissions in existence; one year ago, twenty-four; and now, forty-nine.

There is no question but that the stimulation of this work and the rapid increase in the number of commissions is largely due to the influence of this society.

It seems probable that very soon few cities of over 10,000 inhabitants will be without such an organization for the encouragement of the production of clean milk.

Letters of regret were read by the Secretary. (See page 31.)

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Report of the Committee on Bacteriological Standards.

Presented by Dr. M. J. Rosenau, Washington, D. C.

The methods, so far as applicable, shall be those recommended by the Committee on Standard Methods of Bacteriological Milk Analysis of the laboratory section of the American Public Health Association.

Bacterial counts for Certified Milk should be made at least once a week.

Use agar-agar made according to the recommendation of the committee of the American Public Health Association, containing 1.5 per cent agar and a reaction of +1.0 to phenolphthalein.

Grow at 37° C. for 48 hours, or at 22° C. for 5 days, or 27° C. for 3 days.

When in bottles, milk samples should be obtained in original packages and brought direct to the laboratory, unopened.

As soon as practicable, upon arrival at the laboratory, open the bottle with aseptic precautions, and thoroughly mix the milk, either by pouring back and forth between the original bottle and a sterile bottle, or by agitation for two minutes.

Make no less than two plates for each sample.

Make a control of each lot of medium and apparatus at each testing.

Dilute the milk in the proportion of one part of milk to 99 parts of sterile water; shake 25 times and plate 1 c. c. of the dilution.

Express results in multiples of the dilution factor.

On motion of Dr. Henry L. Coit, the report of this Committee was adopted.

REPORTS OF THE VARIOUS MILK COMMISSIONS.

The Medical Milk Commission of Essex County, N. J.

Presented by Dr. Floy McEwen, Newark.

The Essex County Medical Milk Commission extends greetings to her sister Commissions and begs to report the following advances in the cause of clean milk made by this Commission during the past year.

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The most important single step taken since our last meeting has been the passage by the New Jersey Legislature of the Committee's substitute for Senate No. 251, popularly known as Dr. Coit's bill. This bill, which is designed to give legal status to the Medical Milk Commission, passed the State Senate by a vote of 13 to 0, and the House of Assembly by a vote of 44 to 1, and by the affixing of the Governor's signature, at 12:15 P. M., on the afternoon of April 21st., 1909, became a law.

The bill is entitled "An Act providing for the incorporation of Medical Milk Commissions, and the certification of milk produced under their supervision," and provides for the organization of Medical Milk Commissions, the appointment of their members, defines their powers, establishes standards of milk purity, and protects the term "Certified Milk." As the first law anywhere that gives legal recognition to the Medical Milk Commission, it is justly regarded as a most important measure. A complete statement regarding the bill will be found elsewhere.

Incorporation.—Pursuant to the provisions of this Act, articles of incorporation were filed in the Secretary of State's office, at Trenton, June 2nd., 1909, and the Commission is now a corporate body.

Reorganization.—By resolution adopted March 8th., 1909, the plan introduced by Dr. Charles F. Lehlbach, at a previous meeting, for a more complete organization of the Commission, and the better accomplishment of its work by special committees, which should be responsible for the various departments under its supervision, was carried into effect.

This plan provides for—

A President—Who shall be elected by a majority vote of the Commission, and shall hold office at the pleasure of the Commission.

A Secretary—Who shall also act as Treasurer, who shall be elected by a majority vote of the Commission, and shall hold office at the pleasure of the Commission.

The work of the Commission is distributed through four committees, appointed annually, by the President, whose titles and duties are as follows:—

(1) *Committee on Milk*—(Supervision of the milk from the

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cow to the consumer.)—Milking and Handling of Milk. Sterilization. Distribution. Packages. Temperature. Cans, bottles, utensils. Filling of bottles.

(2) *Committee on Cattle, Feeding and Buildings*.—Breed of Cattle. Health of Cattle. Veterinary Supervision. Inoculation. Housing of Cattle. Cleanliness and Drainage. Feed and Fodder. Buildings and Construction of Barns.

(3) *Committee on Milkers and Employees*.—Health of Employees. Sanitation, sleeping quarters and food. Personal cleanliness of Employees. Medical Supervision. Care of Hand's Uniforms.

(4) *Committee on Bacteriological and Chemical Examinations and Standards*.—Manner and Methods of Bacteriological and Chemical examinations. Supervision of collections for examinations. Water Supply.

Each Committee to report in writing at every regular meeting of the Commission.

The President shall be ex-officio a member of each Committee.

The Veterinarian and Attending Physician shall render their monthly reports to the proper Committee.

Committee of the whole to decide all questions between the contracting parties. Nothing to be done by either without mutual consent.

The design is that the supervision of the dairy by the Committees, shall be exercised through at least one visit each month, by at least one member of the Committee, who shall fill out an inspection blank covering the points under the direction of the Committee, and sign and send it to the Secretary of the Commission.

Each member will therefore make one tour of inspection at least every three months, or four visits each year.

Report upon a case of scarlet fever occurring at the dairy.

On May 20, 1909, the Medical Examiner of the Essex County Medical Milk Commission, Dr. E. E. Bond, of Caldwell, found one of the employees of the Fairfield Dairy covered with an erythematous rash, and while the man had no other characteristic symptom of scarlet fever, he was at once quarantined and

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the case reported to the Committee on Sanitation. During the next two days the man was seen by four members of the Commission, and the Health Officer of Montclair, but were unable to make a diagnosis. The case, however, was removed to the Isolation Hospital at Soho, New Jersey, as a suspect, his quarters disinfected and daily inspection of the employees by Dr. Bond, ordered by the Commission.

On the afternoon of Friday, May 28, 1909, Dr. Bond found an employee with a sore throat. He was at once quarantined in the Isolation Hospital of the dairy, a building set aside for that purpose, where he developed an erythematous eruption, and the case was reported to the Committee on Sanitation.

The following morning he was seen by the Chairman of the Committee on Sanitation, who was able to confirm the diagnosis of scarlet fever made by Dr. Bond.

The case was promptly removed to the Isolation Hospital, at Soho, New Jersey, the living quarters of the men disinfected, and the New Jersey State Board of Health notified, as required by law.

On the following morning, Sunday, May 30, 1909, Dr. Bond discovered a third man who showed a desquamation on his chest. This last case had landed in the United States on Tuesday and had come to the Fairfield Dairy only two days before the examination.

The first and last cases were not certainly scarlet fever, and in the case of the last man it seemed still less likely, as during the three weeks in which he had been in transit from Poland to the United States, he had been under official inspection practically all but two days by the Russian authorities, the ship's surgeon and the Government official at Ellis Island. This man was immediately removed from the farm and a special meeting of the Medical Commission called Sunday night, May 30, 1909, for ultimate consideration and action, to which a representative of the local Board of Health was invited.

As a result of this conference, all milk from the dairy was ordered sterilized, and a statement of the facts ordered printed and attached to, and delivered with, each bottle of milk, until the period of incubation for scarlet fever should have passed.

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The milk is sterilized immediately after milking, in the 40 quart cans, being subjected to a temperature of 155° Fahr., for 30 minutes. The milk is then filtered through sterile absorbent cotton, cooled over the sterilized star cooler, and bottled. By the use of the new automatic filling machine, no hand touches it in the process of bottling.

A copy of the notice attached to each bottle is herewith appended.

Charles E. North, M. D., for several years head of the Lederle Laboratories in New York, and a Sanitary Engineer of distinction, has been placed in charge of the plant and will remain upon the ground indefinitely, personally directing every detail of the work of sanitation.

Plate cultures of the milk are made daily by Dr. North, so as to recognize at the earliest moment the nature and extent of any unusual bacterial contamination.

Visits of inspection to the dairy have been made by representatives of the Montclair Board of Health, the East Orange Board of Health, and a full statement of existing conditions given to the State Board of Health at Trenton.

In the judgment of the Medical Commission, no infection could possibly have reached the milk, and the foregoing precautions are taken until the period of incubation for other cases has passed.

The cordial and responsive way with which Mr. Francisco, our dairyman, met every requirement of the Commission, although at a large personal sacrifice, was one of the most gratifying features connected with this unique work, and we cannot speak too highly of the hearty and loyal co-operation of not only Mr. Francisco himself, but also of his son and indeed all of the division heads in this work, without which the efforts of the Commission could not have become effective.

Important Notice.

This Milk Has Been Sterilized.

During a medical examination of the help employed at the Fairfield Dairy, it was discovered that one of the men was just developing a very mild case of scarlet fever. While it is not

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expected that there will be any serious results, as the case was promptly removed from the farm, the Medical Commission has ordered that all the milk be sterilized before delivery to the consumer. When the Medical Commission deems it safe to resume the delivery of raw milk it will be done.

ESSEX COUNTY MEDICAL COMMISSION.

Discussion--Dr. Henry L. Coit called attention to an error in the statement that the New Jersey law was the first in existence, giving legal recognition to a Medical Milk Commission as New York and Kentucky had such a law, but no comprehensive law of such character has been passed before. Dr. Coit stated that any one desiring a reprint of the New Jersey law could secure the same by applying to the Secretary of the A. A. M. M. C.

The Milk Commission of the Medical Society of the County of New York.

Presented by Dr. William H. Park, Director of Research Laboratory of the New York Department of Health.

Dr. Park reported no change in the regular work of the Commission. One matter of interest had come up. With the new year Dr. Pearson became Commissioner of Agriculture, and at that time it seemed necessary to decide on how the veterinary investigations should be carried on. It was finally agreed that the Commission should be notified at all times and should have power to send an inspector to be present with the veterinarian who was testing for the State. In that way the Milk Commission could have knowledge of the test as carried out. It was agreed to carry out the tests in such a way as the Medical Milk Commission should ask.

The Milk Commission of the Medical Society of the County of Kings, Brooklyn, N. Y.

Read by Dr. Walter B. Ludlum.

The past year has been for this Commission, an uneventful one; there has been little for it to do but carry on a very satisfactory routine. The standard of purity has been maintained

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at 10,000 bacteria per c. c., and this has seldom been exceeded; the average of 622 examinations has been 6116, as compared with 11,340 for the year preceding. Average of butter-fat, 4.71%. During the first three months of this year, there were sold, under the auspices of the Commission, about 50,000 more quarts than for the corresponding time last year, an increase of over 15%. A careful statistical record has been kept by our bacteriologist so that, if any more detailed report is desired, he is quite able to give it, but the preceding seems enough for verbal presentation.

I might take this opportunity to say that at a certain session of the Commission, the question was raised of the Commission paying the dues of its members to this Association; this led to a scrutiny of its Constitution and By-Laws, which showed us that it is an Association of Milk Commissioners rather than of Milk Commissions. It was our strong and unanimous judgment that the name expressed what should be the fact, and that the Constitution should be so changed as to make the Commission the unit of membership. It was to this end chiefly that we offered Amendments, which, we were informed by the Secretary, have been presented to the various Commissions. Of course this required various other incidental changes, and in a general review of the Constitution and By-Laws, we found a few discordant points which demanded harmonizing. It has not, however, been our intention, in other respects, to offer to change the clearly expressed intent of the framers of the Constitution.

Examination of this Constitution will show that some changes must be made to make it an harmonious document.

The Milk Commission of the Academy of Medicine, of Cincinnati, Ohio.

Read by Dr. Henry L. Woodward.

In measuring the progress that has been made by this Commission since its initial report to this Association, in June, 1907, two factors are taken into account. The first is the direct or material increase in the number of dairies under the supervision of the Commission and the great increase of their out-

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put. This increased consumption of pure milk in our city likewise represents the added interest of the profession in the work of the Commission, for it is through them largely that the demand for these products is increased. Under this heading, likewise, comes the greater proficiency of our experts in determining the quality of the milks, as well as the greater frequency with which these examinations are made. In other words, we are far better prepared today, to stand behind our certificate than ever before.

The second factor that marks our progress is that activity on the part of the Milk Commission which has been directed towards the improvement of the general supply of milk of our city. Without rehearsing the fact that the condition of that general supply was most deplorable, and there maintained, through inefficient milk inspection by political appointees, it remained for the Commission to create a public sentiment in favor of a new order of things in regard not only to the guarding of the city's milk supply, but also a better regulation of its entire health affairs.

In June, 1907, we reported the supervision of four dairies, three "INSPECTED," and one "CERTIFIED," with a total daily out-put of 1374 quarts. Since then another CERTIFIED and INSPECTED Dairy has been added to the list. The combined daily out-put today is 950 quarts of CERTIFIED milk, 1292 quarts of INSPECTED milk, and 7 quarts of INSPECTED CREAM. It is gratifying to report that without exception these dairies have proven a success financially, with their products selling at 14c and 10c per quart respectively. This too, in the face of a 6c market milk price. Our regular Bacteriological examinations are now made weekly, with such additional ones as are indicated by the casual fluctuations below the standard.

The pouring of paraffin over the cap and stamping the date before it cools, has done away with the occasional substitution on the part of unscrupulous drivers, thereby materially reducing the number of complaints on CERTIFIED milk.

Referring again to the findings of the Bacteriologist, it might be remarked that it is our experience that the producers of IN-

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SPECTED Milk, rarely, if ever, exceed the limit for that grade of milk, and that the average bacterial content of INSPECTED Milk seldom exceeds that formerly set for CERTIFIED Milk, 30,000. This statement leads to the conclusion that any municipality can rightfully set a bacterial standard of 500,000 for their market milk, and demand that the producer meet this requirement. The Veterinarian's reports indicate a diminution in the number of tuberculous cattle found on test. This shows that the dairymen are buying their cattle more carefully, and that the sale is usually subject to test. The educational influence of the tuberculine test is suggested by the fact that one of the dairymen is now having our Veterinarian immunize the calves against tuberculosis. (Von Behring's Bovo Vaccination.)

In reporting our influence toward the improvement of the municipal supply of milk, we feel justified in expressing our belief that a Milk Commission can be a tremendous factor in the health affairs of a city. They have at their command, the means of definitely moulding public sentiment in favor of reforms, not only relating to the milk supply, but also those concerning the general health affairs of a city. By calling attention to the fact that the Health Officials are derelict in their duty in the guarding of the Milk supply, they awaken public interest in the broader considerations of civic health. When public apathy towards these affairs disappears, efficiency on the part of officials begins. In Cincinnati, for instance, the Health Officials antagonized the Milk Commission in its efforts to establish a State law which would make distillery waste feeding to milch cows an offense. The proposed State bill became a law in spite of the protests of the politicians. A Health Board which had been appointed by this same dominant party, refused to enforce the distillery waste law. Our subsequent attack on them and the public sentiment created by the Milk Commission, in this long drawn out fight, finally made it possible to oust the Health Board itself, and to have one appointed along ideal conditions. The new Board is to be made up of three physicians and two laymen.

The physicians will be chosen from a list of nominations from the Academy of Medicine. Slop Feeding will soon be a

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thing of the past, and we are looking forward with confidence not only to a marked improvement of our Milk supply, but to a far more intelligent supervision of the health affairs of the city.

Of the educational campaigns, entered into by this Commission, in the past two years, none was more successful than the Milk Show held in our city in May, 1909. This Milk Show was comprised of a Pure Milk Exhibit, Dairymen's Institute, a National CERTIFIED Milk Contest, and a Local Market Milk Contest. Several hundred dairymen attended the two days' Institute, while 20,000 Cincinnatians attended the Pure Milk Exhibit. The educational value of the Milk Show, as an entirety, cannot be estimated, and did much to encourage Clean Milk production in this section of Ohio. I can best dismiss the subject by referring to a splendid article by Dr. W. A. Evans, Health Commissioner of Chicago, in the Journal of the American Medical Association, of June 5, 1909, entitled The Cincinnati Milk Show. Any Milk Commission can well further the interest of Clean Milk in its community by arranging for similar Exhibits.

The Milk Commission of the Suffolk District Medical Society.

Presented by Dr. Francis J. Slack, Boston.

The Milk Commission of the Suffolk District Medical Society is now certifying the milk of two dairies, "The Warelands" and the dairy of the Mass. Agricultural College.

The Warelands produces two grades of Certified Milk containing respectively 4% and 4½% fat, and 2,500 certificates are issued for each grade per month. On two or three occasions this Milk has exceeded the 10,000 bacterial limit, but each time the cause has been quickly discovered and remedied.

Once the head dairyman decided suddenly to leave without giving warning and the counts went up very high. Mrs. Ware was immediately notified and went in person to her farm, and within four days the counts were again within the required limit. At another time high counts were traced to an infected udder in one of the cows.

The Mass. Agricultural College Milk has never exceeded the

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bacterial limit. They have been using 7,000 certificates each month. In May 9,000 were ordered, and in June 11,000.

Although the expert examinations are made gratis, it is claimed by these dairies that they are operating at a loss. There are several factors concerned in the small demand for Certified Milk, among which the purity of the general supply probably stands first.

Of 5,843 samples seized by city inspectors from all sources, in 1908, about 60% contained less than 100,000 bacteria to the cubic centimeter. The various milk contractors are keeping close watch over their supplies both by dairy inspection and by bacterial examination of milk. A recent promise by the Board of Health to do away with the sale of so called "loose milk" in the stores, requiring all to be bottled, will without question, when put in operation, still further add to the purity of the general supply.

The second factor is, that there exists an abundant supply of "Inspected milk" furnished through the Norfolk District Medical Milk Commission, and this meets the general demand more thoroughly than the Certified. Other conditions being the same, the public are unwilling to pay from 6 to 8 cents more per quart for a slightly lower bacterial content.

There is also a Committee on Milk and Baby Hygiene, which is supplying a large amount of Modified Milk for babies and which proposes, this coming year, to increase its work on this line and also supply pure whole milk to the mothers.

Altogether there is an improvement in the general milk supply of the city, in which the Certified Milk Commission feels it has its part, and is willing to be counted as one of the factors in bringing about this result.

The Milk Commission of the City of Cleveland, Ohio.

Read by Dr. J. J. Thomas, Cleveland.

The Cleveland Commission have nothing of especial interest to report in the past year. We are producing about 800 quarts per day from a herd of 90 cows.

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Two new buildings have been added to our farm in Novelty, Ohio. A fire-proof barn 40x120 feet, of the most modern type, accommodating 60 cows, will give plenty of room for gradually increasing the herd as necessity requires. A new 2½ story Milk house, situated nearly 200 yards away from the newest barn, and close to electric transportation facilities, is the most important change made with us in the past year. The situation of this Milk house so far away from the barns will undoubtedly go far toward settling the fly nuisance, hitherto an almost unsurmountable obstacle. Our Commission thoroughly tried and adopted the metallic caps with wire and leaden seals, and find the same a great improvement over the cover parchment fastened about the neck of the bottles by rubber bands.

The increased expense involved was met by raising the price of milk 1 cent per quart.

The monthly bacterial counts the past year have been lower than the year before. They have averaged under 5,000, our lowest count was 500. Since discarding our individual cloth strainers 1½ years ago, we have had no evidence of serious contamination in either the milk or cream as revealed by the test of monthly bacterial counts.

The producers of our Milk also own and control the Walker-Gordon Laboratory of Cleveland. Their percentage modification has now for several months been made from Certified Milk. Our producers, we believe, were one of the first to make this step. Unusual expenses have occurred within the past few months, necessitating an advance in the price of Certified Milk from 16 to 18 cents per quart.

The failure of our ice crop, an event which had not occurred in Cleveland for 60 years, required an extra expenditure of \$2000.

At the last annual tuberculin test, made 3 months ago, several cows reacted positively, although many of them had been tested within 6 to 8 months. At the previous test only one positive reaction was obtained out of 90, and she was immediately separated and isolated from the rest. It was not thought necessary to disinfect or fumigate.

This time, however, both disinfection and fumigation were carried out in the most thorough manner, and under the imme-

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diate supervision of our Veterinarian. Our recent experience has not only taught us the importance of thoroughly disinfecting and fumigating after even one positively reacting cow, but forces the conclusion that a semi-annual tuberculin test would be desirable.

We believe the importance of the tuberculin test as well as the desire for producing Clean Milk is making itself felt among the prominent dairymen of Cleveland. Two of the members of our Commission were much interested recently, in coming across a circular sent out by one of the largest distributors of Milk in this city, in which great emphasis was made of important fundamental requirements for a "sanitary milk" from "tuberculin tested cows."

The Milk Commission of the Syracuse Academy of Medicine, Syracuse, N. Y.

Presented by Dr. A. Clifford Mercer.

Dr. Mercer reported that beyond the fact of general progress, the Commission had nothing further to report. He said that the Commission of the Syracuse Academy of Medicine no longer existed. When the State law provided for certain matters regarding the sale of Certified Milk in New York, it became necessary for the Milk to be certified to by a Commission appointed by the County Society, and so the Commission was simply transferred from one body to the other, the name now being the Medical Milk Commission of the Onondaga Medical Society.

The Milk Commission of the Allegheny County Medical Society, Pittsburg.

Read by Dr. P. J. Eaton.

The Milk Commission of the Allegheny County Medical Society has been in existence for two years. This Commission was formed for the purpose of improving the milk supply of Allegheny County.

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As a first step towards this end, it was decided at the first meeting of the Commission to have at least one Clean Milk sold in the city, to whose purity the Commission could certify. To that end standards of purity were determined upon for the production of "Certified Milk."

From the beginning this Commission has been fortunate in having associated with it Dr. J. F. Edwards, who, until recently, has been the Superintendent of the Bureau of Health, of Pittsburgh. Through his kindness the requirements of the Commission were printed in pamphlet form and were sent to all the dairymen supplying milk to the City. These requirements were also sent to all the physicians who were members of the County Society. It was hoped that of all the dairymen who received these circulars, some at least would be willing to comply with the requirements of the Commission. In this hope, however, the Commission was disappointed.

At the same time that these circulars were sent out, the Commission employed the services of a press agent, and endeavored to create a public demand for clean Milk. Through this press agent some little attention was directed towards Clean Milk. The popular cry for Certified Milk, however, was not sufficient to awaken interest in the dairymen in its production. It is possible that if this crusade of education could have been continued at this time, that such a demand ultimately would have been created. This, however, it was impossible for the Commission to do, on account of lack of funds.

The popular demand for "Certified Milk" was not apparent and no dairyman signified his desire to comply with the requirements. This condition of affairs continued and the Commission pursued an expectant plan until March, 1908, when it became apparent that if "Certified Milk" was to be produced in Pittsburgh, it would be necessary for the Commission themselves to actively engage in a campaign of public education, and also for them to see the dairymen personally, and to show to them that the production of "Certified Milk" would be of financial benefit to them.

The Commission therefore, a second time tried to create a demand for "Certified Milk."

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Up to this time the Commission had been surprised to find a very marked apathy towards this subject among the medical profession, themselves. Physicians, while they may have believed theoretically in the need of Clean Milk, did not use it in their families, nor did they impress upon their patients the value of "Certified Milk." With the exception of a very few, no physician gave any outward manifestation to the Commission that they were at all interested in the value of this product.

In order to awaken a greater interest among the medical members, Dr. Henry L. Coit was invited and kindly consented to give a lecture before the College of Physicians and Surgeons, of Pittsburg. Dr. Geo. Goler was also invited and spoke before the Academy of Medicine. These two talks did much good to awaken this lagging interest among medical men.

To increase the popular demand for Clean Milk, the Commission determined to have a public lecture addressed by well known authorities on milk. To defray the expense of such an undertaking, the Commission asked the County Society for Two Hundred Dollars, and the Commission obtained the use of Carnegie Music Hall for May 21, 1908. The Commission were successful at this time in procuring Dr. Rowland G. Freeman, Dr. Rosenau, and other local speakers. This meeting was well attended, and the Commission feel that the meeting did much good.

Previous to this meeting, the Commission themselves, in order to make it a success, determined to give public talks on Milk before different organizations—Civic Clubs, charitable organizations, church organizations, etc. There were forty-three lectures given in all, by the Commission before such societies. These meetings apparently did much at that time to arouse public interest in the subject of Milk.

While these lectures were being given, a press agent was carrying on a vigorous campaign through the papers in an attempt in that way to arouse additional interest.

The Chamber of Commerce was asked to interest itself in this subject of Clean Milk, by appointing from its membership, one to act with the Milk Commission as an advisory member of the Commission.

Realizing that the question of Milk was not a medical ques-

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tion, but was one of universal interest, the Commission asked a local Homeopathic Society to appoint two of its members to act as advisory members of the Commission. Dr. J. F. Edwards, Superintendent of the Bureau of Health, was also asked to act in this capacity.

One month after this public meeting, the Walker-Gordon Laboratory Company undertook to produce "Certified Milk." This company has been producing this product since that time. The Commission believes that the reason why this dairy took up the production of Certified Milk was because of the publicity which these lectures and newspapers had given to this subject.

The demand for Certified Milk at first grew enormously, so that this dairy was unable to supply the demand. During the last summer the demand fell off. At the present time it is increasing, but at this time the Groves Home Dairy has also undertaken the production of Certified Milk, and it is probable that the demand for this summer can easily be supplied by these two dairies. The Commission is also Certifying the Milk produced in Sewickley, a suburb 14 miles distant from Pittsburg.

This Commission only certifies to the cleanliness of Milk. No cream or modified milk or other products of milk is certified,

All the pathological and chemical analysis of milk until recently, have been made by the Bureau of Health. In order to be independent and to have these examinations made whenever the Commission desired, \$2,000.00 was raised by the Commission, asking for voluntary contributions to the work of the Milk Commission. This amount was used to pay for the services of an Inspector and the services of a Pathological Chemist. The Commission at the present time, is therefore an independent organization, and it is hoped that as the amount of "Certified Milk" increases, the return from the seals sold to the dairymen will be sufficient to pay for the running expenses of the Commission.

Dr. Eaton added that a maximum bacterial content had been placed at 30,000. That a good deal had been taught in the schools, especially in the Technical School for Women, a number of lectures having been given on the subject. Dr. Eaton emphasized the benefit derived from encouraging a campaign of

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education along these lines, especially among the women at the women's schools.

There had been one Milk contest held in Pittsburg, under the auspices of the Chamber of Commerce, with an advisory committee from the Milk Commission, which had created a good deal of interest and was very successful. In answer to a question, Dr. Eaton said the price of Certified Milk in Pittsburg is 15 cents.

Discussion—Dr. R. G. Freeman, President, said that he had been amazed at the thoroughness of the campaign that had been carried on in Pittsburg; it had been a most complete success.

The Milk Commission of the Academy of Medicine, of Columbus, Ohio.

Read by Dr. George C. Schaeffer.

The Milk Commission which I have the honor to represent here, is probably one of the youngest in The American Association, and this is the first report of the Commission made before this body. The Commission was appointed at the last meeting of the Academy of Medicine, in June, 1908. At the first meeting held in July, it was decided to ask that the Original Commission of three be enlarged so as to comprise in its membership nine members, five of whom should be physicians, one a veterinarian, one a professor of dairying, one a practical business man, and one a trained nurse. In accordance with our request, these additions were made, and the first full meeting of the Commission was called about the middle of July. The work of organization was completed at once. The committee on requirements, after much labor and correspondence with other commissions, was finally able to agree on a set of requirements and form of contract, which, on presentation to the Commission, was adopted.

One dairyman, who was already well equipped for the work, undertook the fulfillment of our requirements, and after making some changes in his plant, announced himself ready to produce milk in accordance with our requirements.

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The first Certified Milk was put on the market April 15, 1909, and I am pleased to report that it has met with a hearty reception, both from the medical profession and from the laity. Thus far we have only one dairy producing Certified Milk, and none producing Inspected Milk, though we are prepared to certify to Inspected Milk as soon as we shall be able to secure someone to undertake its production.

We have met with the usual difficulties of new Commissions, but we have to report a very successful year, and feel that the work we have undertaken is bound to be productive of much good in the future, not only in the matter of supplying a clinical milk for the use of babies, and the sick, but in the salutary effect the work will have upon the market milk of the city.

The Milk Commission of the Academy of Medicine, Toronto, Canada.

Read by Dr. Henry T. Machell.

At a General Meeting of the Academy of Medicine held on the 6th of October last. it was decided unanimously that a Milk Commission be established, and at a meeting of the Executive Council of the Academy, on the 13th of the same month, the following members of the Academy were appointed: W. L. T. Addison, Jno. A. Amyot, Allen Baines, C. J. C. O. Hastings. Alex. McPhedran and Henry T. Machell.

Any vacancies which may occur in the Commission are filled by the President of the Academy, on the recommendation of the Commission.

We met two days later, when a Chairman, Secretary, Bacteriologist and Chemist, and a Veterinary Inspector were appointed.

The Commission meets monthly, or more frequently, if thought necessary. The veterinarian and dairymen attend if we wish them to do so. At present we certify to only one article—Milk.

The requirements adopted by us are:—

Bacteriological and Chemical. There must be no pus, blood,

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or injurious germs. A maximum bacterial count of 10,000 is allowed during June, July, August and September, and 5,000 during the other months. The fat content is fixed at 4%, but a variation of .5% above or below that, is permitted. The total solids must not fall below 12%. The Milk must neither be watered nor frozen, nor must any preservative be added. It must be cooled to 45° F. within half an hour after milking, and kept below that temperature till delivered to the Consumer. It must be delivered within twenty-four hours after milking.

The Veterinarian is required to apply the tuberculin test to all cows before admission to the herd, and to the entire herd twice yearly, afterwards. We exclude suspicious as well as typical reactors. He is also to report as to the cleanliness of the dairy, and the health of the employees, and any matter of a hygienic nature.

The Physician for the next month is selected from ourselves at our regular meetings. He also reports as to the health of the employees, etc.

The certificates which are issued to the dairymen on the 20th of each month, contain the usual statement that the milk is up to our requirements; that the certificate is good for one month, and that another will be issued in another month, if everything is satisfactory to the Commission.

Through the kindness of Hon. Mr. Hanna, Provincial Secretary of Ontario, we are enabled to have our bacteriological and chemical examinations made at the Laboratories of the Provincial Board of Health, in charge of Prof. Jno. A. Amyot, one of the members of our Commission. For these examinations, there is no charge to the dairymen, but they pay our Veterinarian \$10.00 per day. The traveling expenses, the tuberculin, and any broken thermometers are extra. The organization expenses, such as printing, cards, etc., were met by the dairymen.

One dairy, Price & Sons, received its first certificate on the 4th of February, 1909, less than three months after we were given authority to make use of the Health Laboratories for our examinations. This dairy competed at the Cincinnati Milk Contest, held a few weeks ago, and was rated third, but was only one and one half points below the dairy taking first place.

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Another dairy, Manor Farm Dairy, received its first certificate a fortnight ago.

A third dairy, Dentonia Farm Dairy, has had its herd tuberculin tested, and is getting its plant in shape to produce Certified Milk. These dairies are within a radius of 15 miles of the City. The price of Certified Milk in Toronto has been fixed by the dairymen at 15 cents per quart bottle.

The dairymen supply their own pulp caps, certificates and parchment covers at their own expense. Our interviews with them have always been cordial.

We regret that the profession, our patients, and the people, do not more generally avail themselves of the opportunity to secure a good milk. At the present time, the supply exceeds the demand.

Discussion:—Dr. W. H. Park, New York, said, in regard to refusing to allow suspiciously reacting cows to remain in the herd, that the point raised was very important. It is necessary to isolate the suspicious cows. They have found it wise to require 18 hours for the last temperature test, and had found that many of the suspicious cows, when kept separately, had turned out to be definitely reacting cows, on later tests.

The Milk Commission of the San Francisco County Medical Society, Cal.

Read by Dr. Philip King Brown.

The Milk Commission of the San Francisco County Medical Society, has become a permanent Commission, in so far that its members were appointed by the President of the County Medical Society, to serve 1, 2, 3, 4 and 5 years, respectively. All new appointments are made for 5 years, thus making only one change in personnel each year. Two members at large are elected by the Commission each year; at present Dr. Geo. S. Baker, Chief of the Pacific Coast Division of the Bureau of

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Animal Industry, Washington, D. C., is one member, and Mr. Nathan Moran, an attorney, the other member elected by the Commission. Their services are most valuable on the technical and legal sides.

It has been necessary to cease certifying one dairy, for persistent violation of the requirements of the Commission.

At present the first dairy certified is distributing 1090 quarts daily in San Francisco; its complete herd is now certified, and has been re-tested this spring, and the second barn rearranged to the requirements of the Commission.

The second dairy is supplying the towns of Alameda and Berkeley, working there under the certificate of the Alameda Co. Medical Society, to whose authority the Oakland Home Club has transferred "Certified Milk." This dairy is distributing 260 quarts in San Francisco and 204 in Alameda Co.

Our total distribution is 1350 quarts daily, and at our last report, a year ago, it was 350, the certificate having been issued first in April 1908.

The expenses of the Commission are now paid by a tax of $\frac{1}{8}$ of a cent on each certificate; the dairyman paying for his own seal, and the expense of chemicals, bacteriological and veterinary inspection.

The general Milk situation in San Francisco is being worked on steadily by a Milk Improvement Association, in which the Milk Commission has three members; and there has just come into existence a movement to supply Certified Milk to the "boarding out" babies of the Associated Charities, and to the various sick babies coming under the care of dispensaries and hospitals. This fund is to pay the difference in price between *Certified* and *Commercial* Milk.

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The Milk Commission of the Passaic County Medical Society, Paterson, N. J.

Read by Dr. Francis H. Todd.

The Passaic County Medical Society, on June 9, 1908, authorized its President to appoint a Milk Commission to consist of five members. These appointments were made and the members organized September 21, 1908. After visiting almost every dairy in our County, we found a dairyman who was willing to take up the contract. Unfortunately, before we could start, the dairyman died, and as there was no one to continue his work, we were obliged to find some one else to take up the contract. We have succeeded in finding a suitable dairy and we expect, during the summer, to have Certified Milk in our County. Our Commission was incorporated May 24, 1909, under the new State law providing for the incorporation of Medical Milk Commissions and the Certification of Milk produced under their supervision.

The Milk Commission of the Indianapolis Medical Society, Indiana.

Read by Dr. William Shimer, Indianapolis.

Papers were read before our Medical Society last summer, advocating the certifying of milk and at that time a committee was appointed to investigate the matter.

The committee reported favorably and the Commission was appointed which met for organization on September the first, 1908.

A meeting of the dairymen supplying the City was called, at which there were about fifty present, and only two stating their willingness to certify.

The first certificates were issued to the Walker-Gordon Dairy, February 13, 1909. and since that time our progress has been satisfactory, except that we have not been able to create quite the demand for the milk that we should like.

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Some of the physicians of the Medical Society have done their part in recommending the milk, but on the whole the Commission has not met with the response it should have.

Aside from the physicians, our only means of advertising has been through what the newspapers would give us, and in this they have been very liberal.

The Milk has been very satisfactory, and has exceeded the count only twice, and aside from that averaging about 1,800.

We have a bacteriologic count once per week, a chemical examination for Temp. fats and proteids once per month, and a veterinary inspection once per month.

The standards are 10,000 bacteria and 3.6 to 4% Fat, Temp. 45° F.

The bottles are covered with the cap of the Commission, furnished at one-half cent per cap, which is sealed with paraffin and dated; over all is a parchment held on by a rubber band.

During the summer the Milk is used by the Charity Milk Stations throughout the City, and this will help take up the output, which is about four hundred and sixty quarts from sixty-eight cows. We are selling at the present time, only about one hundred and fifteen quarts.

The Milk Commission of the Union County Medical Society, Elizabeth, N. J.

Read by Dr. Arthur Stern.

As the Secretary of the Milk Commission of the Union Co. Medical Society, of New Jersey, I would like to report for one of the youngest Milk Commissions of this State.

The Commission was organized February 5th, of this year, after Dr. Coit had addressed the County Medical Society, in October, 1908.

We have sent out our preliminary requirements to the dairy-men, but as the milk men of our County are not prepared to make this year, such alterations as are necessary in order to

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comply with the standard of Certified Milk, it will probably not be before next year that we can enter into a contract with a dairyman. One of the dairymen wrote me that it was due to the scarcity of ice that he could not comply with the rules, and a few others are in the same predicament and cannot change their barns and stables to comply with our rules. Meanwhile, we intend to get milk from our neighboring counties for the hot summer months, and hope to appear before you next year fully established. We get a moderate amount of milk into Elizabeth from the Walker-Gordon Laboratory, in Plainsboro, N. J.

Letters of regret from the following were read:

Charles G. Kerley, New York.
A. W. Myers, Milwaukee, Wis.
E. B. Voorhees, New Brunswick, N. J.
W. G. Murphy, Hartford, Conn.
B. C. Frazier, Louisville, Ky.
Charles N. Haskell, Bridgeport, Conn.
J. R. Ward, Worcester, Mass.
Thomas S. Roberts, Minneapolis, Minn.
John W. Trask, Washington, D. C.
L. E. Holt, New York.
A. R. Ward, California.
H. D. Chapin, New York.
J. M. Eager, Assistant Surgeon-General, Washington.
G. W. Goler, Rochester, N. Y.
Thomas M. Rotch, Boston, Mass.
Alfred Friedlander, Cincinnati, O.
J. L. Morse, Boston, Mass.
J. H. M. Knox, Baltimore, Md.
H. E. Tuley, Louisville, Ky.
M. P. Ravenel, Madison, Wis.
Wm. P. Northup, New York, N. Y.
A. P. Norris, Cambridge, Mass.
C. W. Brown, Elmira, N. Y.

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The Wheeling, W. Va., Certified Milk Commission.

Read by Dr. William H. McLain, Secretary.

The Commission is composed of eleven members, selected from the Ohio County Medical Society, and the Wheeling Board of Trade.

The first meeting was held March 27, 1909, Dr. Robert J. Reed being elected Chairman, and Dr. W. H. McLain, Secretary.

Doctors Eugene A. Hildreth, Andrew X. Wilson and W. H. McLain were appointed by the Chairman, to serve as members of the Executive Committee for the term of one year.

This Commission will enter into a written agreement with any dairyman desiring its certification, provided the products of the dairy meet its requirements. The Commission will control the character of the product and the conditions in general, through the reports of three experts; a chemist, a bacteriologist, and a veterinarian.

The aim of the Commission has been to follow as closely as possible the suggestions made by Dr. Henry L. Coit, and to imitate the Medical Milk Commission of Essex County, New Jersey, in its general plan of work.

Initial Work. It was decided to raise one thousand dollars, but the interest in Certified Milk was such that no general appeal to the public was necessary. The sum of eleven hundred dollars was subscribed by fourteen people, and had it been necessary, thrice that amount could have been secured.

Advertisements were placed in the daily papers calling the attention of dairymen to the fact that the Commission would Certify the product of all dairymen who could meet and observe its requirements.

Four applications were received by the Executive Committee, and, after a careful investigation, Mr. Lawrence A. Reymann was selected.

Mr. Reymann's farm is 600 acres in extent, and is located on a hill about six hundred feet above the city of Wheeling. The barn is a model one, very well lighted, and the King System of ventilation is used.

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The herd is a well selected one, composed of sixty thoroughbred Ayreshires, which have been tuberculin tested annually, for the past three years.

The necessary changes are now being made, under the direction of Mr. Vinol, who has taken a dairy course at Cornell. He will have direct charge of all dairy work.

A milk house and sterilizing room are now being constructed. These will contain the best features of four or five Certified Milk plants, which were recently inspected.

Standards Adopted by Commission. Fat, 4, and not over 5, per cent; solids, 13 per cent; bacterial counts, 10,000 maximum for all months of year. The technique will be that described generally by Swithinbank and Newman. Milk must be delivered under 50 degrees, and the tuberculin test is, of course, required.

Working Methods. Certification will begin as soon as all requirements are met, and in this the owner of the farm is as particular as the Commission.

Our paid veterinarian will make a monthly examination and inspection of the dairy. In addition, one of the Executive Committee will make a weekly inspection of the employees and the general conditions of the dairy. Owing to the location of the farm, this can be easily done.

Chemical and bacteriological examinations will be made by members of the Commission, for the present. These will be made at least once a week, and without expense to the Commission.

The movement to secure Certified Milk has aroused much public interest. Practically every physician in Ohio County has pledged himself to prescribe it when it is indicated.

The Commission is already planning to distribute Certified Milk to the poor, without cost, when it is considered necessary by the physician in charge.

The general Milk supply of Wheeling comes from 87 dairies in West Virginia, 38 in Ohio, and 10 in Pennsylvania. Total number of cows, 1998, and 3981 gallons of Milk are produced daily.

During 1908, only five per cent of the 2084 specimens examined for fat were below the standard of 3.5 per cent. These

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records, with the name of the dairyman, are published monthly in our daily papers.

The bacterial counts are also published every three months, since Jan. 1909. This plan has been found a very successful one. Three counts, one each month, are made, and the average published quarterly.

For the first three months of 1909, thirty-five dairymen averaged 100.000 per c. c.; twenty-three averaged 300.000, and only twelve were above 300.000.

Discussion. Dr. Henry T. Machell, Toronto, Canada, said, in regard to the publication of the different bacterial counts in the daily newspapers, that he did not quite agree with that idea, as there might be a mistake or accident, by which a particular dairyman's count might run up high at a particular time, and if published in that way, might result in great injury to that man, and would therefore be an injustice, if his work was ordinarily good.

Dr. Henry L. Coit, Newark, said it had been the policy of the Essex County Commission, never to publish any numerical findings. That policy had been adopted on the advice of Dr. Freeman. He recalled an instance where a purveyor of Milk, who had contracted to sell Certified Milk for a producer of Certified Milk, published a comparison between his Pasteurized Milk and that of Certified. He drew a comparison between the Pasteurized Milk which contained about 84 over and above the number of bacteria reported in the Certified Milk. His newspaper advertisement, which was ostensibly for the purpose of obtaining patronage for the Pasteurized Milk, was at the expense of Certified Milk.

Dr. Andrew Wilson, Wheeling, said that an average was published quarterly, and that the only instance where any injustice could be done in this way would be in case of accident to a man ordinarily producing clean milk. In that case many counts with control would be made. If he continued to run high counts, he would be put in a lower class. It compelled the dairymen to deliver their milk on ice, as, if they did not, of course their counts would continue high.

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Discussion. Dr. Bracken, Minneapolis, said that as he understood it, the discussion referred to Certified Milk, and that the publishing of the bacterial count referred to Commercial Milk. He did not think the publishing of the bacterial standard of Commercial Milk should be considered wrong. If a dairyman's product should persistently show a high bacterial count and poor quality, it is but justice to the public that it should be made acquainted with the fact.

The Milk Commission of the Montgomery County Medical Society, Dayton, Ohio.

Presented by Dr. W. F. Smith.

Dr. Smith said that the Commission was organized by authority of the Montgomery County Medical Society, in 1907. The first milk was sold in 1908, and consisted at the first delivery of 5 quarts; they sold now about 400 quarts. The bacterial count was about 10,000, and they had been averaging something like 1,500. They sold at 9 and 12 cents; Inspected Milk for 9 cents, and Certified Milk at 12, the latter milked in the morning hours, the former the night before.

At the Milk Show in Cincinnati, the dairyman received honorable mention, his average being about 93%. The standard agar medium was being used in making the bacterial growth. The members make periodical visits to the dairy, and the physicians of the City are invited and urged to do so. The Commission is operating at a financial gain. A recent meeting of the Montgomery Medical Society had been given up to the question of producing a Certified Milk, and there were three words used in the talk of one of the speakers that seemed to condense the matter very forcibly; "confidence," on the part of the public, which can be had by support of the physicians; "competency," that the dairy is able to produce clean milk; "compensation," that the dairyman should have a competence to establish him on a proper basis. The Certified Milk question in Dayton had been treated in a manner very beneficial to the City of Dayton. Conditions had been very bad, and the betterment had been very great. In a report to the County Medical Society by Dr.

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Hoffman, statistics were given as to the death rate of babies under one year, which in 1907 was 16%, and in 1908, 10%.

The Milk Commission of the Medical Society of the County of Albany, New York.

Read by Dr. Henry L. K. Shaw, Albany.

Dr. Shaw said that he would simply state that the Milk Commission of the Medical Society of the County of Albany was still Certifying to Milk. The City was not able to support more than one Certified Milk producer. They have one man who is doing very excellent work, with counts from 3,000 to 6,000. They are selling about 130 quarts a day; price, 14 cents. They were trying to educate the public as much as possible to the use of pure milk.

The St. Louis Pure Milk Commission.

Read by Dr. Albert Merrell, St. Louis, Mo.

To convey a correct impression of the work of the St. Louis Pure Milk Commission, attention is called to the fact that it was organized in July, 1904, by representatives of leading circles of philanthropic activity, in the City, including physicians and other citizens, men and women, who were alive to the importance of a Pure Milk supply. Their general purpose was to educate the community by practical demonstration, through measures to promote the production of clean milk.

As infants and invalids are the greatest sufferers from impurity of milk, their relief was first sought, believing that it would be an object lesson of great value in solving the problem of a complete clean public supply.

The Commission then pursues two general purposes, or objects, viz: the modification and distribution of milk for infants, in the crowded districts of the City, and the promotion of the production of what we know as Certified Milk.

During the first year, the distribution of infant food engrossed most of their effort, and a full year was required before a dairy was found who would undertake to fulfill its requirements for Certification.

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They now certify to seven dairies, with an average production of 12,000 gallons per month, distributed through the three largest Milk companies of the City. The producers pay to the Commission 1% of their retail price per quart, for the expense of inspection. This work is now selfsustaining.

Our experience has convinced us that the satisfactory growth of public interest in Certified Milk was much assisted by our distribution of Milk for infant feeding.

The growth of the demand for bottled infant food from 495 bottles per day during the first year, to an aggregate of 2,013,281, or an average of 1,532 per day for the entire time of operation, shows the appreciation of the beneficiaries of this department of our activity.

Public sentiment now constantly and increasingly demands Pure Milk, when formerly it seemed indifferent.

Dairymen are generally improving equipment and methods, and many are producing a better milk than ever before, though not yet able to maintain the requirements of Certification.

Many inquiries as to these by dairymen, show that public demand is for higher standards, and that they must be met if their business is to be held.

An important amendment of one of our State laws, relating to the disposal of cattle condemned by veterinary inspection, requires that the State veterinarian shall see that such animals are shipped to the nearest point where their disposal can be made under U. S. Government inspection, and that the owner shall be paid a stated sum when the animal is slaughtered.

We believe that the execution of this law will result in a large increase in the number of dairy herds that are free from disease, and that they can be kept free.

The inspection of the dairies certified by the St. Louis Pure Milk Commission, is made by a Certification Committee, including all the physicians who are members of the Commission, the city chemist, city bacteriologist and city veterinarian.

Inspection by a sub-committee of physicians is made monthly for each of the seven dairies, and special inspections are made when trouble exists. The chemist and bacteriologist take sample bottles of Certified Milk of each producer, from distributing

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wagons, when and where they please, and mail the results of their examination to the Certification Committee. These examinations are usually twice a week. At the monthly meeting the reports are considered and certification continued; orders made for improvements or certification suspended when needed.

No charge is made for services of City Officers.

The City Veterinarian supervises the health of our herds, and all examinations not personally made by him must have his approval.

The advantage to the public of this co-operation of the City Officers is manifest.

We suggest for your consideration:

That the date of milking be stamped in a prescribed manner on each package of Certified Milk, as an important guide in its use for infant feeding.

That the percentage of fat be also designated to inform physician or consumer of its commercial and food value.

In Conclusion. The Commission feels encouraged with its progress to date, and its present status.

They fully recognize, however, that increasingly higher standards must be enforced as clearer conceptions develop as to what constitutes clean and pure milk.

The Kansas City, Mo. Pure Milk Commission.

Read by Dr. Geo. C. Mosher, Chairman.

Dr. Mosher said that they were undertaking certification, prescription feeding of infants, and the education of the public as to the advantages of pure milk. The County Medical Society had endorsed the Commission, but as yet no dairy had been certified. In his work of teaching obstetrics and infant feeding, in connection with the Dispensary work of the Medical School of the University of Kansas, he had realized, in a marked degree, the need of pure milk, and finally, not finding a farmer he could interest in a sanitary dairy project, started Hillcrest Farm, with a herd of Holsteins, and a sanitary barn, modeled after the Walker-Gordon barn, at Charles River, Boston.

The position of owning a model dairy farm, and urging

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mothers to buy milk from him at a high price, was anomalous and embarrassing, and the farm passed into other hands independent of the Commission. The present proprietor has increased the capacity of the plant, and is keeping up the standard of the old management, and is getting it ready for certification.

The production of modified milk for infant feeding had been carried on through nine stations where the milk is prescribed and advice given the mothers by a physician and a trained nurse. The infant mortality had been greatly reduced. When the work was started, three years ago, it had been said that nine-tenths of all the dairy wagons distributing milk in Kansas City were using formaldehyde; at present no milk of that kind is being sold.

The Commission has been very fortunate in having the endorsement and the encouragement of the press of Kansas City, and much good has been done along the line of educating the people as to what constitutes pure milk, and what to expect from the dairymen in general, bottled milk, clean milk, and cold milk until delivered.

Under the direction of Rabbi Mayer, President of the Commission, Mr. Charles Sachs, Secretary, Mr. Gustave Bernheimer, Treasurer, Rev. Chas. W. Moore, Supt. of Distribution, and Dr. Mosher, Chairman of Certification, the work will be pushed from this time, in a more methodical way.

The Commission has been fortunate in securing the services of Mr. Hal Lynch, son of the Chairman of the Commission in St. Louis, to be Superintendent of the Laboratory. Mr. Lynch was instrumental in helping to establish the work here, and we feel no doubt that next year we shall have the work going in a satisfactory manner in all departments.

Special Communications.

The Canadian Medical Association Milk Commission.

Dr. Charles J. Hastings, Toronto, after expressing his appreciation of the invitation to be present, said that he felt, after listening to the reports that had been read, that he was somewhat

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out of order, as they were all, apparently, dealing with Certified Milk, only. For the interest that had been aroused, they ascribed to the American Association of Medical Milk Commissions, practically all the praise. He thought that if Dr. Coit had achieved nothing else in medical science, he had immortalized his name from this work alone. He had presented this very important subject before the combined sections on public health and laboratory workers, just a year ago at the meeting of the Canadian Medical Association, at Ottawa. After a free discussion, a recommendation was handed in to the Executive, that a Commission be appointed to be known as the Canadian Medical Association Milk Commission. The recommendation was unanimously acceded to and the Commission was forthwith appointed. In the beginning of the work, they had gone carefully into the question of mortality produced by existing conditions in market milk. They had also found that a little less than one-half of one per cent of the milk consumed in the United States last year came up to the standard required for Certified Milk, and not quite one per cent of the three million quarts consumed daily in New York City came up to that standard, notwithstanding the admirable and arduous work done by the various Milk Commissions. On that account, in addition to securing the greatest possible amount of Certified Milk, they felt the necessity of looking after the great bulk of the milk, and endeavor to make it at least safe, and therefore, when the Commission was appointed, its duty was to act, as far as possible, in conjunction with the various Health Departments, in endeavoring to secure such legislation as would warrant them in enforcing certain rules and regulations, and the carrying out of careful inspection. The classification, therefore, that they have recommended for the Dominion, is (1) Certified, (2) Inspected Pasteurized Milk.

In Toronto, the Certified Milk supply is being carefully looked after by the Commission of the Academy of Medicine, therefore our Commission is bending its energies on the control of the general supply of the City, in endeavoring to establish a system of inspection by which we can hope to get the milk, at least, microscopically clean, and then have it officially pasteur-

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ized. All pasteurization to be under control of the Health Department. They felt that Commercial Pasteurization affords only a false security to the public. The Commission was composed of representatives from all the cities in the Dominion, having a population of ten thousand or over, and at our next meeting at Winnipeg, we hope to establish sub-Commissions in all of these cities.

Cooperation of the Department with the American Association of Medical Milk Commissions.

Mr. B. H. Rawl, Chief Dairy Div., U. S. Dept. of Agriculture.

In the absence of Mr. Rawl, Prof. C. B. Lane, who spoke for him, said that the Department was in full sympathy with the work of the Association of Medical Milk Commissions, and would be glad to give any assistance it could at any time. They were particularly anxious to give assistance towards keeping up the high standards established by the Association. They desired to see the Commissions established on the broadest possible basis, and wanted to see the production of Certified Milk not limited to the fadist, but would like to see it become a money-making business, and there seemed to be no reason why it should not. It should be kept under the direction of Medical Milk Commissions, absolutely. They would not sanction certification by any organization who could not affiliate with the Medical Milk Commissions. The Department had a great deal of correspondence concerning the subject, and a good deal of opportunity to render assistance to the Commissions. He felt that there were some things the Department could do which no one else seemed able to accomplish. He cited a case of a city just about to organize a Commission where several dairymen had been selling Certified Milk, where the Dairy Division was called upon to visit these dairies and make recommendations. That was done and assurance received that the recommendations would be carried out to the letter. As their inspectors traveled about, they had opportunity to see the good results from the establishment of these

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Medical Milk Commissions throughout the country. They tended to educate the medical profession and laity, and helped the local Boards of Health. He desired to again assure the Association that the Dairy-Division was with it, and would respond whenever called upon.

REPORT OF COUNCIL. Read by Dr. Henry L. Coit.

The Council begs leave to submit the subjoined report of their meeting, June 6, 1909, at the St. Charles' Hotel, Atlantic City, N. J.

The following Milk Commissions were recommended for election to membership in the Association.

Broome County Medical Society, Binghamton, N. Y.; Silver Bow County Medical Society, Butte, Montana; Canadian Medical Association, Toronto, Canada.; Chicago Medical Society, Chicago, Ill.; El Paso County Medical Society, Colorado Springs, Colorado; Academy of Medicine, Columbus, Ohio; Wayne County Medical Society, Detroit, Michigan; Union County Medical Society, Elizabeth, N. J.; Milk Commission of Galesburg, Ill.; Kent County Medical Society, Grand Rapids, Michigan; Greenwich Medical Society, Greenwich, Conn.; Indianapolis Medical Society, Indianapolis, Ind.; Duval County, Jacksonville, Florida; Jackson County Medical Society, Jackson, Mich.; Galva District Medical Society, Kewanee, Ill.; Kansas City, Mo.; Ocean County Medical Society, Lakewood, N. J.; Malden Medical Society, Malden, Mass.; Hennepin Medical Society, Minneapolis, Minn.; Los Angeles County Medical Society, Pasadena, Cal.; Passaic County Medical Society, Paterson, N. J.; Santa Barbara Medical Milk Commission, Santa Barbara, Cal.; Sanitary Dep't of the City of Seattle, Washington; Academy of Medicine, Toronto, Canada; Warren County Medical Society, Warren, Pa.; Wheeling, W. Va.; Worcester, Mass.

The following individual members were recommended for election:

Dr. Bruce Keator, Trenton, N. J.

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Dr. Victor A. Norgaard, Honolulu, Hawaii.

Dr. A. Clark Hunt, Trenton, N. J.

Mr. B. H. Rawl, Washington, D. C.

Mr. S. M. Shoemaker, Eccleston, Md.

Dr. Chas. E. North, New York City, N. Y.

The Council extended to the following persons the privilege of participating in the scientific work of the Sessions of the present year:

Miss Alice Lakey, Cranford, N. J.

Dr. J. R. Mohler, Washington, D. C.

Dr. G. R. Pisek, New York City, N. Y.

Mr. Geo. W. McGuire, Newark, N. J.

Mr. Henry C. Hines, N. J.

Mr. Edw. B. Goodell, Montclair, N. J.

Mr. Wilbur C. Phillips, New York City.

Dr. M. Royal Whitenack, Newark, N. J.

The following gentlemen have been nominated for the various offices of the Association:

For President, Dr. Samuel McClintock Hamill, Philadelphia.

For Secretary, Dr. Otto P. Geier, Cincinnati.

For Treasurer, Dr. Albert W. Myers, Milwaukee, Wis.

For Council, to serve for five (5) years, Dr. Ogden M. Edwards, Jr., Pittsburg.

The Council defers its decision as to the time and place of meeting of 1910, pending the decision of the American Medical Association, as to its place of meeting next year.

The Council finds it necessary to fix the Annual dues for the present year at the same figure as those of last year, viz: \$3.00. In making this recommendation, it desires to state to the Association that it appreciates the disproportion of the dues of the various Commissions, but trusts that the Commissions will give the Association the same financial support that they have in the past years, until certain amendments to the By-Laws to be submitted at the present meeting shall have been passed upon and become effective.

It was moved, seconded and carried that the place of pub-

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lication of the proceedings of the 1909 meeting be left to the Publication Committee.

It was also moved and seconded that the Publication Committee, consisting of Drs. Coit, Tuley and Geier, be continued. Carried.

Amendments to the Constitution and By-Laws originally projected by the Brooklyn Commission, were offered by Dr. Hamill and ordered presented before the general meeting, on the next day.

On motion, duly seconded, the report of the Council was accepted, and the names of candidates recommended were elected to membership.

The report of the Treasurer was read, adopted and referred to an Auditing Committee, Drs. Walker and Eaton.

JOINT COMMITTEE REPORT.

Report of Committee Appointed to Confer with Certified Milk Producers' Association.

(Report of a sub-committee, appointed by the Joint Committee of the American Association of Medical Milk Commissions and the Association of Certified Milk Producers, on the Methods and Regulations for the Medical Examination of Employees, their health and personal hygiene.)

I. Medical Examination of Employees.

Read by Dr. Henry L. Coit.

We, the undersigned, submit the following as a Committee Substitute for the report of the Standing Committee, presented at the last Annual Meeting of the American Association of Medical Milk Commissions, June 1, 1908, and respectfully recommend its adoption.

First.—That a Medical Officer shall be selected by the Commission, who shall be a physician in good standing and authorized by law to practice medicine; that he shall be responsible to the Commission and subject only to its direction, and he shall receive a yearly salary which shall be fixed by the Commission but paid by the dairyman for whose employees the Medical Commission require his services.

Second.—Unless suitable quarters are provided off the farm for the occupation of an employee, under suspicion of having a contagious disease, that a suitable building be set apart to be used only as a quarantine building and hospital, to be one story high, and to contain at least two rooms, each with a capacity of about 6,000 cubic feet, and containing not more than three beds; the rooms to be separated by a closed partition. The doors opening into the rooms shall be on opposite sides of the building and provided with locks. The windows shall be barred and the sash shall be at least five feet from the ground, and constructed for proper ventilation. The walls shall be of a material which will allow proper disinfection. The floor should be of painted or washable wood, preferably of concrete, and so constructed that the floor may be flushed and properly disinfected. Proper lighting, heating and ventilating facilities shall be provided.

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Third.—Arrangements shall be made with a bacteriologist of recognized ability, for the examination of cultures taken from the employees for the purpose of diagnosis. In the event of any illness of a suspicious nature, the attending physician shall immediately isolate such person and notify the secretary of the Commission, and in case of any throat lesion, the attending physician shall make cultures and send them at once to the bacteriologist for examination. If the examination shows a contagious condition, the chairman of the Commission shall appoint a Committee to assume charge of the matter, which Committee shall have the power to act for the Commission as their judgment dictates.

Fourth.—The milkers shall consist, if possible, of unmarried persons, who, in addition to ordinary habits of personal cleanliness, should also have well trimmed hair or hair covered with close fitting caps, and have clean shaven faces.

Fifth.—Before any person shall come on the premises to live and remain as an employee, such person, before being engaged in milking or the handling of milk, shall be subjected to a complete physical examination. No person shall be employed who has not been vaccinated recently, or who, upon examination, is found to have a sore throat, or to be suffering from any form of tuberculosis, venereal disease, conjunctivitis, diarrhoea, dysentery, or who is proved to be a typhoid carrier, or who has any inflammatory disease of the respiratory track, or any suppurative process or infectious skin eruption, or any other disease of an infectious or contagious character, or who has recently been associated with children sick with contagious disease.

Sixth.—A separate bed shall be provided for each milker, and each bed shall be kept supplied with clean sheets.

Seventh.—Proper bathing facilities shall be provided for all employees on the dairy, premises, preferably a shower bath, and frequent bathing should be enjoined.

Eighth.—Following a weekly medical inspection of the employees, a monthly report shall be submitted to the Secretary of the Medical Milk Commission, on the same recurring date by the examining visiting physician, who shall use the following schedule, filled out in writing and signed by himself:

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This is to certify that, on the dates below indicated, official visits were made to the.....dairy, owned and conducted by.....of..... (indicating town and State), where careful inspections of the dairy employees were made.

- (a) Number and dates of visits since last report.
- (b) Number of men employed on the plant.
- (c) Has a recent epidemic of contagion occurred near the dairy, and what was its nature and extent?
- (d) Have any cases of contagious or infectious disease occurred among the men since the last report?
- (e) Disposition of such cases.
- (f) What individual sickness has occurred among the men since the last report?
- (g) Disposition of such cases?
- (h) Number of employees now quarantined for sickness.
- (i) Describe the personal hygiene of the persons employed for milking, when prepared for, and during the process of milking.
- (j) What facilities are provided for sickness in employees?
- (k) General hygienic condition of the dormitories or houses of the employees.
- (l) Suggestions for improvement.
- (m) What is the hygienic condition of the employees and their surroundings?
- (n) How many employees were examined at each of the foregoing visits?
- (o) Remarks.....

Ninth.—When a case of contagious disease is found among the employees of a dairy producing Certified Milk, under a contract with a Medical Milk Commission, such employee shall be at once quarantined, and as soon as possible removed from the plant, and the premises disinfected. It is also advised that a printed notice of the facts shall be sent to every householder using the milk, giving in detail the precautions taken by the dairyman under the direction of the Commission, and it is further advised that all Milk produced at such dairy shall be heated at 140 degrees F. for forty minutes, or 155 degrees F. for thirty minutes, or 167 degrees F. for forty minutes, or 190 degrees F.

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for one minute, and immediately cool to 50 degrees F. The foregoing facts should also be part of the notice, and such sterilization of the milk should be continued during the accepted period of incubation for such contagious disease.

(Signed)

HENRY L. COIT.

STEPHEN FRANCISCO.

After some discussion, participated in by Drs. Harvey, Park, Shaw, Machell and Freeman, Dr. Eaton moved, That the report be accepted as an advisory report for the use of the Commissions for this year, and continuance of the Committee and the consideration of the advisability of making any sections of it mandatory at the next meeting. The motion was seconded and carried.

II. Score Card and System of Scoring Proposed to Establish Standing of Certified Dairies in U. S.

Read by Dr. Hamill.

That it is the sense of the Executive Committee of the American Association of Certified Milk Producers, that a score card be adopted by the American Association of Medical Milk Commissions and the Certified Milk Producers Association of America, and,

Further, it is the sense of this Executive Committee, That no producer should be considered for the production of Certified Milk by a Medical Milk Commission unless his conditions show a score of 90% or more.

Further, a system of scoring should be adopted under which detached statements of conditions obtained at the dairy shall be reported to one Central Committee, for the entire country, which shall reduce these reports to per centage standings.

Reports of conditions to be made on forms approved for this purpose, by the Joint Committee, representing the two Associations, said reports to be made by persons residing in the localities of the dairies who are acceptable to the local Commission and the dairyman.

Similar reports to be made from time to time, also, by a Federal or State official, not interested locally, and who shall be

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designed for this purpose by the Committee representing the two Associations.

On motion of Dr. Coit this report was adopted.

Dr. A. C. Mercer, Syracuse, moved that all the standards adopted by this Association be published in pamphlet form, interpagged with fly-leaves, to be furnished at cost to any one desiring the same. (Referred to Committee on Publication.)

Dr. R. G. Freeman presented the amendments to the constitution and by-laws, and stated that if there was no objection, copies would be sent out, the amendments to be acted upon next year.

Delegates' Meeting.

The meeting was called to order by Dr. R. G. Freeman, and the recommendations of the Council for Officers of the Society presented, on motion the nominations declared closed, and the Secretary instructed to cast the affirmative ballot for the nominees, who were accordingly declared elected.

For President—Dr. Samuel McC. Hamill, Philadelphia.

For Secretary—Dr. Otto P. Geier, Cincinnati, Ohio.

For Treasurer—Dr. Albert A. Myers, Milwaukee, Wis.

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PROGRAM—SECOND SESSION.

The Present Status of the Commercial Pasteurization of Milk.

JOSEPH S. EVANS, JR., M. D., Philadelphia, Pa.

The Medical Milk Commission, Its organization, Its minimum requirements for certification, Its scope of work, and Its extension.

Discussion opened by HENRY L. CORR, M. D., Newark, New Jersey.

The Bacteriological Examination of Milk—Technique and Apparatus.

FRANCIS H. SLACK, M. D., Director of the Laboratory of the Health Department of Boston, Mass.

The Character of Milk in Small Communities.

PROF. H. CONN, Wesleyan University, Middletown, Conn.

Legislation Relating to the Production and Protection of Certified Milk.

Discussion opened by FLOY McEWEN, M. D., Newark, New Jersey.

The scoring of Dairies for raising the grade of Milk.

PROF. RAYMOND A. PEARSON, State Commissioner of Agriculture, Albany, New York.

A Plan for Annual Certified Milk Contests.

MR. CLARENCE B. LANE, In charge Market Milk Investigations, Dairy Division, U. S. Dept. of Agriculture, Washington, D. C.

The Relation of the Medical Milk Commission to the Establishment and Conduct of Infant's Milk Depots.

DR. J. W. KERR, U. S. Public Health and Marine Hospital Service, Washington, D. C.

Report of the Delegates on the Election of Officers.

ADJOURNMENT.

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The Present Status of Commercial Pasteurization of Milk.

Abstract.

Joseph S. Evans, Philadelphia.

Those interested in a pure milk supply in its relation to Public Health, must, at this time, have a clear conception of the possibilities and limitations of the Pasteurization of Milk as employed commercially in large cities.

The ideal milk supply, of course, is that coming from tuberculin tested herds, the production being so regulated that the bacterial content is low and non-pathogenic in variety. Such a supply exists in many cities in the form of Certified and Inspected Milks, but the demand for this article of food is much greater than the production under these conditions. Methods, therefore, must be employed to render the bulk of milk safe. Do the present methods of pasteurization accomplish this?

In a communication to the Philadelphia Pediatric Society, the writer condemned the methods employed in that city in 1904. The milk was being heated from 158° F. to 162° F., for a period of 1½ to 4 minutes. The cream line was injured, and the following counts indicate that the process was inefficient:

Plant No. 1.

Raw Milk contained	6,544,000 bact. per ccm.
Pasteurized Milk contained.....	46,000 bact. per ccm.
Cooled & Bottled Past. Milk contained.....	4,290,000 bact. per ccm.
Cooled & Bottled Past. Milk (at time of Delivery)	24,000,000 bact. per ccm.
Cooled & Bottled Raw Milk (at time of Delivery)	12,000,000 bact. per ccm.

Plant No. 2.

Raw Milk contained.....	5,900,000 bact. per ccm.
Pasteurized Milk contained.....	68,000 bact. per ccm.
Cooled & Bottled Past. Milk contained.....	6,000,000 bact. per ccm.
Cooled & Bottled Past. Milk (at time of Delivery)	12,000,000 bact. per ccm.
Cooled & Bottled Raw Milk (at time of Delivery)..	8,000,000 bact. per ccm.

Plant No. 3.

Raw Milk contained.....	1,090,000 bact. per ccm.
Pasteurized Milk contained.....	18,000 bact. per ccm.
Cooled & Bottled Past. Milk contained.....	26,000 bact. per ccm.
Cooled & Bottled Past. Milk (at time of Delivery).	78,000 bact. per ccm.
Cooled & Bottled Raw Milk (at time of Delivery)..	2,180,000 bact. per ccm.

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Subsequent examinations confirming these findings, the deductions were that the method was inefficient, because the degree of heat employed was not applied for that length of time necessary to kill many of the important bacteria; and the technic was improper, because of the reinfection of the milk during the cooling and bottling.

In contrast to these findings, tests made daily at one plant using a newer method (the holding method), during the period November 1908 to June, 1909, gave surprisingly good and constant results. The maximum, minimum, and average daily counts of the bottled product at the time of delivery, 24 hours after pasteurization, during this period were as follows:

During		
November	December	January
Maximum..... 7,000	Maximum.....27,000	Maximum.....30,000
Minimum..... 200	Minimum..... 150	Minimum..... 150
Average..... 1,543	Average..... 2,231	Average..... 5,902
February	March	April
Maximum..... 13,000	Maximum.....12,500	Maximum..... 6,500
Minimum..... 500	Minimum..... 500	Minimum..... 150
Average..... 3,597	Average..... 3,455	Average..... 1,755
May		
	Maximum..... 7,000	
	Minimum..... 150	
	Average..... 2,168	

Examinations of the method, which consists of heating milk to 142° to 145° and holding at that temperature for thirty minutes, thereby exceeding the thermal death point of *B. tuberculosis*, as proven by Rosenau, gave the following average counts during the period of seven months:

Raw Milk.....	1,500,000 bact. per ccm.
Pasteurized (Flash Method).....	25,000 bact. per ccm.
Pasteurized (Held for 30 min.).....	1,000 bact. per ccm.
After Cooling.....	1,325 bact. per ccm.
Bottled.....	1,725 bact. per ccm.
Bottled (24 hours later).....	3,500 bact. per ccm.
Raw (24 hours later).....	4,550,000 bact. per ccm.

These results indicate that the method is efficient, but to what degree they were due to the technic employed at this individual plant was only to be determined by the examination of other plants.

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Plants Using the "Flash" Method.

Plant No. 1. During May, 1908.

Maximum Count.....	4,440,000 bact. per ccm.
Minimum Count.....	25,000 bact. per ccm.
Average Count.....	671,409 bact. per ccm.

Plant No. 2. During May, 1908.

Maximum Count.....	2,640,000 bact. per ccm.
Minimum Count.....	177,000 bact. per ccm.
Average Count.....	830,000 bact. per ccm.

Plants Using the "Holding" Method.

Plant No. 3. During May, 1908.

Maximum Count.....	9,960,000 bact. per ccm.
Minimum Count.....	9,000 bact. per ccm.
Average Count.....	1,076,869 bact. per ccm.

Plant No. 4. During May, 1908.

Maximum Count.....	2,280,000 bact. per ccm.
Minimum Count.....	6,000 bact. per ccm.
Average Count.....	505,900 bact. per ccm.

Plant No. 5. During May, 1908.

Maximum Count.....	618,000 bact. per ccm.
Minimum Count.....	7,000 bact. per ccm.
Average Count.....	133,131 bact. per ccm.

We are forced therefore, to the conclusion that proper pasteurization depends not only on an efficient method, but upon the individual handling that method.

Conclusions.

1. Until proper regulation of the production of milk is instituted and enforced, pasteurization must be employed commercially.
2. Any method which employs sufficient heat to injure the cream line in order to destroy *B. tuberculosis* should not be permitted.
3. The best method is that which heats the milk to 142° to 145° F., and maintains that heat from 20 to 30 minutes.
4. Because of varying results obtained with the same method in the hands of different operators, the pasteurization of milk should be under the control of the municipal authorities, who should regulate the degree of heat and the length of time that it is applied, and who should inspect and control the methods of handling the milk after heating.

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Discussion.—Dr. R. G. Freeman said he thought that the concrete information given as to the manner of re-infection of Commercial Pasteurized Milk was very valuable, and that Boards of Health should exercise the most careful supervision over this product.

Dr. H. L. K. Shaw, Albany, thought that the facts the doctor had brought out should, if possible, be brought before the laity. He said that what we want is not so much Pasteurized Milk as Clean Milk, and that it was Clean Milk that we must contend for. In Albany, a few years ago, a bill had been introduced to compel the Pasteurization of Milk. The physicians had opposed it for the reason which Dr. Evans had so well set forth in his paper.

Dr. C. J. Hastings, Toronto, considered that this was one of the most important subjects that the Association could discuss.

The term "Pasteurization" had been abused more than any other term in connection with the milk problem. As to Pasteurized Milk producing scurvy, rickets, etc., that is practically ancient history. It was not the pasteurization that was responsible, but the faulty methods. As Prof. Henwood, of the University of London, Eng., expresses it (1st) Improper Pasteurization. (2nd) Pasteurization of improperly procured milk and (3rd) Improper care of Pasteurized Milk. The three terms, Inspected, Officially Pasteurized and Refrigerated, could not be disassociated. If the refrigeration at all times of the Pasteurized Milk be insisted on, much of the difficulty would be overcome. Their Commission had emphasized Certified Milk as the ideal, but, inasmuch as only a limited amount of that could be had for some time to come, they next recommended Inspected Pasteurized Milk, hoping by this inspection to get milk that was at least microscopically clean. This did not require any unreasonable demands as regards the producer, as they only asked what they would of any other article of diet placed on our tables—that is, Christian cleanliness. We would not want a stable man to come to our dining-room after cleaning out the stable and grooming the horses, and, without washing his hands,

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prepare our meals—yet these men are handling, in this filthy way, the most sensitive, and yet the most valuable article of diet we possess.

Discussion.—Dr. W. H. Park, New York, said in regard to lactic acid bacilli destroying the other bacteria, he was sure, from personal work, that they do not destroy the pathogenic bacteria until such a development is reached that the milk was unfit to drink. It would contain at least twenty million bacteria per c. c.

He had done quite a little work in comparing the holding method with the other, and thought Dr. Evans correct, that the flash method does destroy pretty nearly as many bacteria, when it is carefully operated.

The Health Authorities could enforce the proper Pasteurization of milk, and he believed they should. He did not like to use the words "Commercial Pasteurization," because there are some firms that do produce good Commercial Pasteurized Milk. It did not mean that because the milk is Pasteurized one could have any sort of conditions on the farm; it should be as good milk as the conditions made possible, even if it was to be Pasteurized.

Dr. M. J. Rosenau, Washington, said his work had shown that perhaps more depended upon the men behind the guns than on anything else. It was easy enough to heat milk to a certain temperature for a moment, as in the flash method, or longer in the other methods, but unless one has the proper technical knowledge of all the difficulties, just what Dr. Evans described, may happen. In some of his experiments he had found that with a good machine, but careless operators, the milk contains more bacteria after Pasteurization than before, while with the same machine and intelligent operation, satisfactory results had been obtained.

He desired again to enter protest againsts the word "Pasteurization," which had been misconstrued to be synonymous with Pure Milk. It is nothing more than heated milk plus the further requirements of refrigeration, care, etc. The degree of heat, the time of exposure and the date on which the Pasteurization was done, should be given. So far as proper Pasteurization was con-

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cerned, he thought Dr. Evans and Dr. Park had struck the key note in saying that the process should be under official surveillance—that it should be legally controlled by the Health Officers.

If lactic acid bacteria were desirable in milk, and as most of them are destroyed in the process of Pasteurization, it would be an easy matter to add them after the milk has been Pasteurized.

Discussion.—Dr. W. A. Evans, Chicago, expressed his approval of the remarks that had been made by the previous speakers. They had a City Ordinance in the City of Chicago, requiring that the milk coming into that City must either come from cows proven free from tuberculosis by the tuberculin test, or else it must be pasteurized. They had 30,060 cans of milk a day. 95% came from a distance of less than 50 miles. Of that 18,000 are pasteurized; 7,000 are from cows free from tuberculosis; the other 5,000 cans being still not under the control of the ordinance. Pasteurization is sometimes done properly; sometimes improperly; it is to be controlled just as raw milk is controlled. It may go wrong in various stages, just as the production of raw milk can go wrong.

They now have a Milk Commission with two Certified Dairies, and a third that will be ready in a short time. He thought the great problem was not so much that of the child that could afford Certified Milk—they were not the ones suffering from bad milk—but was that of the unprotected poor children. It was there that care was required, and to the help of that group of children Certified Milk in the main didn't come. Protection is needed for these children against the dangers of raw milk, as it is; against the dangers of the milk that is to be sold at cheap prices. The comparison should not be between Certified Milk and Pasteurized Milk, but between Pasteurized Milk and Raw Milk, of the poorer qualities. Breaks may occur in the production of Pasteurized Milk, and they frequently do. Only last week, he said, they got a count in a Pasteurized Milk of 20,000,000. It was easier to control a few Pasteurizing plants than to control 12,000 farms, however. They had that many, and the milk came from 120,000 cows. It was easier to control the production of Pasteurized Milk than to control the various

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steps of the production of milk in the country, and its transportation into the city. 20% of their raw milk contained colon bacilli. Some pasteurizers are now using a controlling temperature device by which the record is made on a dial, which can be looked in and to which the Department has access. That, however, would not help in the control of time.

He had given the subject a great deal of thought, to the relation of pasteurization to clean farms, and it was his judgment that Pasteurization with them was making for improvement of farm conditions. They constantly met with the scepticism of the farmer, who didn't believe there was anything in all this agitation for pure milk, or that disease can be conveyed by bad milk. The requirement of Pasteurization had been a great educational factor. It had enabled them to get better farms and better cows for producing milk. Their suggestions had never met with as much compliance as since the Pasteurization Ordinance had been in force. The farmers held that if so much expense is being gone to, to purify the milk, there must be something in the idea that milk can be harmful. They had also gotten 30,000 cows tuberculin tested, which represented a very rapid advance, and he believed that nothing had been so responsible for this as the matter of allowing optional testing. Under the compulsory law they had failed. Obligatory testing had been responsible for the testing of about 500 cows; optional testing had resulted in the testing of 30,000. It was easier to control Pasteurization than to control tuberculin testing. He believed there was more in accuracy in these tests as done in Illinois, than in Pasteurization. In Indiana, tuberculin testing had been done by the State, and there was little to complain of there, but other States, from which their milk supply came, had been much less accurate. He was of the opinion that we could no more neglect the control of Pasteurization than we could neglect the control of the farm. It was a duty of all to see that the farms were made clean, and for the next five years there would be the additional duty of seeing that the products are Pasteurized before being sold.

Discussion.—Dr. F. J. Slack, Boston, believed that heated milk is more susceptible to bacterial growth than raw milk.

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If Pasteurization was to be done, it should certainly be under the control of Health Boards. The milk should not be sold in bulk, but should be kept bottled until sold.

Dr. Evans said that in Chicago the milk is not allowed to be sold in bulk in the stores.

He could not agree with the idea that bacteria multiply more rapidly in Pasteurized milk, as a flat statement.

The Medical Milk Commission, Its Organization, Its Minimum Requirements for Certification, Its Scope of Work, and Its Extension.

Dr. Henry L. Coit, Newark, N. J.

The Medical Milk Commission had its inception in the efforts of the author of the plan, to solve problems in infant feeding. It was co-incident with the early work in this country, on the artificial nutrition of infants; the need for clean milk having engaged the earnest efforts of physicians to obtain it for this purpose. This, with the general need for milk pure enough for feeding the sick, is the largest single factor today in sustaining the interest in this subject.

To accomplish its object, the Medical Milk Commission brings into its field of activities several other professional workers besides physicians, namely: The analyst, the bacteriologist, and the veterinarian, and because milk is so largely responsible for the transfer of communicable disease, it commands the attention of sanitary research workers, and all who study the questions of morbidity and mortality.

The Medical Milk Commission is therefore, First: A Professional Agency for securing clinically clean milk, and cannot properly extend its activities, which are voluntary and unpaid, to accomplish more without defeating the objects of its organization.

Second: By example, it exerts a powerful educational influence upon all who are engaged in the production of milk in the section in which it is organized, and at work, and thus to raise the grade of all market milk.

Third: It is engaged in a field which requires for itself and stimulates elsewhere, research in several important branches of medical science.

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Fourth: It brings together in co-operation for a common public good, the physicians, the professional sanitarian, and experts in medical chemistry, biology and dairy hygiene.

Therefore the Medical Milk Commission is logically organized to include in its membership only those who by special training can best direct these various agencies in the attempt to obtain clinically clean milk. It is for this reason that this Association of Commissions resolved that the Medical Milk Commission should be strictly a medical organization, and in order to protect its high purposes, resolved that its component membership should receive the appointment or endorsement of a representative medical society before admission.

The membership in the local Medical Milk Commission, as organized on the American Continent, while the number on each Commission is not uniform, ranges from three members to one hundred. The experience of the original Commission would seem to justify the wisdom of limiting the membership to twelve, all of whom, or at least a majority of whom, should be physicians.

Moreover, since the experts who work under the direction of the Commission are paid officers, and in most instances, are paid by the dairymen, it seems best that these should be designated for employment by the Commission, be responsible to and become amenable to the Commission, and be under their direction, so that they can be removed for just cause.

Less than twelve members cannot well perform the duties devolving upon these Commissions, provided that the four lines of supervision, as indicated by the plan, are effectually carried out.

These consist first of: Systematic and regular medical examinations of the employees on a dairy under the direction of a Commission, and a continuous knowledge of their health and personal hygiene. Second: Regular and frequent chemical analyses of the milk to determine food values, together with frequent bacteriological examinations, as a detective control over the methods employed in the collection and handling of milk. Third: Supervision, other than that made by the paid experts, of the dairy hygiene in stable, in dwellings, and in the detail of collecting, handling, refrigerating, bottling, and the transfer of

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the milk. Fourth: Supervision of the Veterinarian in his work of selecting and protecting the herd, and his methods for the detection of disease and the exclusion of tuberculosis.

It seems desirable that three members of the Commission, and not one, should be personally responsible for each one of these four features of the medical control, and each individual should report to the Commission on the fulfilment of the requirements after a personal inspection at least four times every year. This the public have a right to expect of the Medical Milk Commission.

The result of such medical control of milk production, chiefly designed for clinical purposes, was given a name, and when coining the term "Certified Milk," it did not occur to the writer that it would be comprehensive enough to cover the activities of over fifty Medical Milk Commissions, but time makes thought more concrete, and the development of an idea simplifies it. The dictionary definition of the term "Certificate" is "a documentary declaration regarding qualifications, service, conduct or other advantageous facts—more official than a recommendation, but usually not proceeding directly like a license from a public authority."

The minimum requirements for the certification of milk by a Milk Commission, are now fixed by standards of quality and purity for Certified Milk, and by methods and regulations to be employed in its production adopted by the American Association of Medical Milk Commissions.

As to the scope of the Commissions' work, I would submit that with the great responsibility resting upon this body in a community where it is developing Certified dairies for producing milk so safe, so sound, and so strictly clean that it is above the requirements of the law, it would be better not to include in the functions of the Commissions the establishment and conduct of Milk Charities, except as a Commission may develop milk philanthropy by organizing separate societies for this purpose, or as an individual member of the Commission may be designated to direct this kind of work through proper professional channels.

In the development of the Medical Milk Commission idea,

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I am content to bear the proud distinction of being called the "Apostle of Certified Milk." The appellation of "Epistle" has been justly given to our energetic secretary, Dr. Otto P. Geier.

There were only fifteen Medical Commissions in existence when he began his work, which resulted in the organization of this Association, and today, three years afterward, there are in this country and Canada, nearly sixty such Commissions.

Let me, in a word, reiterate Dr. Geier's plan for extension. Secure the financial support of some person or persons who would enable the Association to employ an educated physician to devote his entire time to the educational work of Clean Milk, under the direction of the Association.

Going to a city, he could study the milk conditions of that section in homes, hospitals, and the open market; make cultures, counts, charts, and lantern slides, and then, before the County Medical Society, or other representative medical body, portray the milk conditions of that section and disclose that city's "bad eminence;" urge the appointment of a County Society Commission, and thus start a crusade against impure milk.

This would be the most efficient means to extend the growth of the Medical Milk Commission and carry forward its philanthropic warfare for Clean Milk.

The Bacteriological Examination of Milk: Technique and Apparatus.

Francis H. Slack, M. D., Boston, Mass.

Bacteriological examinations of milk supplies have been made but for few years, yet it is everywhere being recognized today that these tests are a most valuable aid in protecting public supplies from impurity and contamination.

The bacterial count is the most useful of all laboratory milk examinations, since it reveals any departure from sanitary methods of production and handling, and in requiring that "Certified Milk" shall be marketed while containing less than 10,000 bacteria to the cubic centimeter, we virtually control all the factors involved, and insist upon the utmost cleanliness and care in every detail.

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We have, in the bacterial content, an Inspector who is always on duty, and our minute directions as to the care of the stable, cows, utensils, and the milk itself, must be faithfully carried out, lest our Inspector give an unfavorable report.

We must not forget, however, that the bacteria in milk are of many varieties, and come from various sources, and no combination of food and temperature is suitable to the development of all these forms, so our efforts should be directed towards that technic which will give us the closest possible estimate to the real bacterial content. When, through faulty methods, such as the use of media of improper composition or unsuitable incubation of plates, the estimation of bacteria is far lower than it should be, an injustice is done to the consumer, when through improper technic, either in the care of samples or in plating bacteria, increase in the samples, or are introduced to the plates by imperfectly sterilized implements, or dilution water, thus making the count higher than it would be, an injustice is done to the producer.

Since the bacterial count holds such a strategic point in the battle for pure milk, it is of the utmost importance that the methods of making this count be as nearly as possible exact.

To this exactness of method, we should also add uniformity of procedure in the various laboratories; and to the members of this Association is due their share of credit that unanimity of methods is becoming general, and that there exists today among the laboratory workers of the United States and Canada, an almost universal willingness and readiness to cooperate towards establishing uniform technic for the bacteriological examinations of milk.

A paper presenting technical methods is necessarily dry, and your indulgence is requested during a brief consideration of familiar details. Should these meet your approval and support, the cause is advanced by so much, in that we have agreed on common technic. Should any point seem ill advised and unsuitable, there is no better place than a meeting of this kind to expose its weakness and suggest the remedy.

The methods here presented are at present being considered in detail by a Committee of the American Public Health Asso-

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ciation, in anticipation of a report next October, and I am glad of this opportunity of presenting them, though necessarily in a crude manner, on account of time limitations, for your friendly criticism and discussion.

Collection of Samples.—The sample of milk for bacterial analysis should be taken and kept in such a manner that the bacterial content shall not be changed either by the method of taking or in the interval between collection and analysis.

In taking samples of "Certified Milk," it is best not to unseal the package, but rather to take either a pint or quart bottle directly to the laboratory in a properly iced receptacle.

Samples of "Inspected" or "Market" milk may be taken in sterile bottles or test tubes, the tubes to be preferred for bacteriological tests alone, the bottles where both bacteriological and chemical tests are to be made from the same sample.

Where the whole bottle is not taken, the milk should be thoroughly mixed, either by shaking, stirring or pouring, in order that a representative sample may be procured.

Media.—Personally, I can recommend a 1% agar agar medium, reaction +1.5 acid, for routine examinations. Arrangements have been made for thoroughly testing this medium against the 1½% agar reaction +1. recommended by the A. P. H. A. Common Water and for their work.

1. Boil 20 grams of thread agar in one liter of water until dissolved. Make up loss by evaporation to 1000 grams.

2. Infuse finely chopped lean beef for twenty hours with its own weight of distilled water in the refrigerator—say 1000 grams of meat, 1000 grams of water.

3. Filter infusion through cloth to remove meat, using pressure.

4. Weigh infusion, say 900 grams.

5. Add peptone, 2% (18 grams).

6. After peptone is dissolved, titrate, reaction probably +4.5 to 5.

7. Bring reaction to +3. or double that finally desired.

8. To the 900 grams of meat infusion (with peptone) add

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900 grams of the agar jelly described in No. 1.

9. Heat over boiling water (or steam) bath thirty minutes.
10. Restore weight lost by evaporation.
11. Titrate.
12. Adjust reaction to final point desired, +1.5.
13. Boil five minutes over a free flame with stirring. Restore loss by evaporation.
14. Filter through absorbent cotton, passing the filtrate through the filter repeatedly until clear.
15. Titrate to determine whether or not the desired reaction has been maintained. Sterilize for twenty minutes for three successive days.

The reasons for recommending this medium are:

Agar agar medium is preferred by most workers for routine milk examinations.

For routine milk work, plain agar medium has been shown to give higher counts than whey agar, lactose agar, etc.

This particular medium has been shown to give constantly higher results than agar of different reactions or percentage strength.

Dilutions.—For plating, all milk should be diluted and the sterile water necessary for all dilutions may be supplied in test tubes graduated to 9 c. c., and bottles or flasks graduated to 99 c. c.

Ordinary potable water, sterilized, may be used but care should be taken to have the sterilization complete, since some of the spore forms which may be found in such water are extremely resistant.

It is well to subject the water to a pressure of 15 lbs. in a steam sterilizer for one hour. In order that the bottles and tubes may contain 99 and 9 c. c. respectively, after sterilization, they should be filled a little above these marks.

Petri dishes with porous earthenware covers, will be found more satisfactory than with the ordinary glass covers, since the latter favor the formation of spreaders, by condensing the moisture. Prof. Harrison, of the MacDonald College, recommends as superior to porous covers for this same purpose, inverting

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the dish and placing within the glass cover a strip of sterile filter paper wet with glycerine.

Sterile 1 c. c. pipettes are needed in quantity, two or three being required to a sample.

Plating. The technic of plating should be followed with unvarying uniformity, a variation in any point effecting the results.

The agar should be thoroughly melted and then transferred to a water bath regulated between 40° and 45° C., nor should plates be made until it has remained in this bath a sufficient length of time to have reached the same temperature, at least 15 minutes.

The milk sample should be thoroughly mixed. If, in the original bottle, this may be done by pouring it into a sterile bottle and back several times; milk in test tubes or collecting bottles should be shaken 25 times before withdrawing the 1 c. c. for dilution, not that 25 shakes is preferable to 15 or 50, but that it does give the milk a fair mixing, and the technic should be uniform. It is not probable that shaking the whole milk breaks up to any great extent, clumps and masses of bacteria contained therein. Duplicate plates of shaken whole milk and milk diluted and shaken with water invariably give higher counts with the latter, and it is reasonable to infer that better separation of bacterial masses and chains is obtained in the lighter liquid.

That dilution should be used which will give about 200 colonies to a plate, ranging from 40 to 400; where a 1-10 dilution exceeds this number, the 1-100 dilution is more accurate, thus 1-10 and 1-100 should be the proper dilutions for Certified Milk, 1-100 and 1-1,000 for Inspected Milk, while 1-1,000 and 1-10,000 usually will be found satisfactory for Market Milk.

The proper dilution may be easily ascertained before plating by a microscopic examination of a properly prepared sediment.

Controls.—Plating should be always checked by controls. A blank should be plated with each set of milk plates for control on the water, petri dishes, pipettes, etc.

Certified Milk should always be plated in duplicate and occasional duplicate plates should be made with other grades.

Plating should always be done in a place free from dust and currents of air. 10 c. c. of medium should be used to a plate.

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Incubation.—The bacteria found in the milk are so varied that no one temperature is suited to all, and our efforts are directed to ascertaining that temperature which will, as a rule, prove best for the greatest number.

Those growing best at 37° C. may properly be said to represent moist filth, which reaches the milk either from the cow, or the hands of the milker, while the forms which develop at lower temperature are more representative of the dry dust of ill-kept stables. Most of the comparative tests have been made with 37° C. and 21° C., and with these temperatures practically similar results have been obtained, with two days incubation at the former, and five days at the latter.

It has been suggested by several that a temperature of about 25° C. would be ideal, combining the advantages of 37° and 21°, and comparative work has been done in at least one laboratory (Dr. W. H. Park's), which seems to prove that such a temperature offers better facilities for growth to the ordinary milk bacteria than any other. The plates have to be grown at this temperature for three days. The incubator is more easily regulated than is the 21° C. incubator.

The writer would be glad to know of other tests contrasting either 37° C. or 21° C., with 27° or 25° C., or of any who are willing to make such comparative tests.

The Microscopic Estimate of Bacteria in Milk.—Several years ago the writer, while examining a large number of routine milk samples, under the direction of Dr. H. W. Hill, noticed that the number of bacteria visible in stained smears of the sediment, bore a fairly constant relation to the number of colonies in plates grown from the same samples and from this observation the microscopic estimate of bacteria became a routine procedure in the laboratory, and has been followed with much profit to the present time.

The apparatus and the method for making the microscopic estimate are as follows: The special apparatus for centrifugalizing the milk, modified from one used by Stewart, of Philadelphia, for leucocyte counts, consists of an aluminum disk and cover, 10 inches in diameter and $\frac{5}{8}$ of an inch in depth, fitted to hold twenty small glass tubes, arranged radially. These tubes hold

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about 2 c. c. each, and are closed at both ends with rubber stoppers.

The milk sample is thoroughly shaken, the tubes filled, stoppered, inserted into their proper numbered receptacles in the disk, and centrifugalized for ten minutes, at a speed of from two to three thousand revolutions a minute. Thus in each tube, the whole sediment from a known quantity of milk is obtained, and may be spread over a given area. A space of about 4 sq. cm. is most convenient, being the right size to allow thorough emulsion of the sediment, with a drop or two of sterile water, and to permit drying into a thin, even smear. It is convenient to smear a number of samples consecutively on a long glass slide, which has previously been correctly spaced with a blue pencil.

To obtain the sediment with the least disturbance, the stopper is first removed from the inner, or cream end; then the tube is held with the cream end downwards, the cream removed with a platinum loop, and the milk poured out; lastly, still holding the cream end down, the other stopper is carefully removed with the adhering sediment, and the sediment smeared evenly, with a drop of sterile water, over the measured space on the glass slide, the stopper being rubbed directly on the glass until the sediment has been transferred. When this is properly done, the amount of diluted sediment remaining on the stopper is practically negligible. The smear is then dried with gentle heat, and stained with methylene blue.

The microscopical examination of a milk sediment thus easily prepared, reveals more than any other single test. It shows the character of the milk, the approximate number and the morphology of the bacteria, and the presence of inclosed leucocytes or streptococci.

It is not claimed that all the bacteria in the milk subjected to centrifugalization are precipitated into the sediment; but it is claimed that in 99 per cent. of the samples, a representative number is precipitated.

The original work on this method was done in comparison with plates grown 24 hours at 37° C., and it was found that the number of bacteria in a representative 1½ oil immersion field

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multiplied by 10,000, gave approximately the number to a cubic centimeter of the milk.

Since, however it has been proven that a 48 hour incubation at 37° C., gives a fairer estimation of the number of bacteria it is evident that a higher factor than 10,000 should be used. Dr. Wilcox, of the New York Research Laboratory, uses a factor of 20,000.

In its present state, this method would be of no practical value in certifying milk since 10,000 per cubic centimeter is so small a number. Any milk, however, which, in a sediment so prepared, shows no bacteria on microscopic examination, and many such are found even in routine work on market samples in Boston, may be safely passed as within the "Inspected Milk" standard. In fact, such milks contain, as a rule, less than 50,000 bacteria to the cubic centimeter. It is in the control of market milk that this method is to have its greatest field for usefulness. doing away to a great extent, with the more complicated plating methods of counting bacteria.

By its use, a good idea of the condition of a single sample of milk can be obtained in less than twenty minutes. Thirty samples can be examined in an hour. At the contractor's receiving station, one man could easily examine 100 to 200 samples daily, thus keeping close watch over the dairies.

In routine city inspection, only those samples need be plated which are doubtful or above the limit established. In this work the plate would corroborate the microscopical findings and strengthen the evidence for court cases. Where plates are to be made, the microscopic estimate gives an indication of the proper dilution to use.

Leucocytes are present in all normal milks, and their number occasionally fluctuates greatly, without apparent cause. Milk from animals suffering from udder inflammations almost constantly shows a high leucocytic content, and without question, is unfit for human consumption.

While there is no point in the milk from a single animal where we can say it passes from normal to abnormal in this respect, enough research has been made to prove that the mixed milk from several normal animals very seldom exceeds 500,000

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leucocytes to the cubic centimeter. While healthy cows, with no distinguishable lesions, may occasionally, for short periods, pass this limit, such variations are very transient in character, and if the mixed milk from several cows shows such high content of leucocytes, it is suggestive of some abnormal condition.

While a leucocytic count of 500,000 or more to the cubic centimeter in the case of a single animal may be transient and negligible, when found in mixed milk it is sufficient evidence to warrant the demand for a satisfactory veterinary inspection of the herd.

Concerning the proper technic for use in the estimation of leucocytes, it may be said that probably more extended and careful work has been done on this problem during the past five years than any other single milk determination.

Stokes, Bergey, Stewart, Trommsdorff, Doane & Buckley, Savage, Russell & Hoffman, Stone & Sprague, each have developed the special tests which bear their names. To the earlier workers belong the honor of pointing the way, to the latter, that of perfecting the technic and throwing light on the interpretation of results.

These tests are all centrifugal, and may be roughly divided into two classes, the smeared sediment, the technic of which has been described, and the more accurate and complicated test with the use of the Thoma Zeiss blood counter, the technic of which is too well known for me to comment on here.

The smeared sediment test seems more practical for routine inspection work.

Stone & Sprague have devised a tube for quantitative and qualitative analyses of milk sediments for which they claim the following advantages over the ordinary tube. 1st. It measures more accurately the sediment. 2nd. Smears of the sediment may be made as with the Stewart tube. 3rd. The column of the sediment tends to become stratified so that the different elements can be easily made out. 4th. The tubes are more easily cleaned.

The tube is practically a combination of Trommsdorff's and Stewart's.

With this tube Stone & Sprague have been able to detect,

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without microscopical examination, the presence of cases of acute mastitis, when the milk was diluted 30 times with normal milk. For ordinary routine work, they recommend centrifugalizing 15 c.c. of milk and using 1-10 of 1 c.c. of a leucocyte sediment as a maximum limit. The character as well as the quantity of the sediment should be taken into consideration. A sediment from cases of even slight mastitis practically always having a yellowish or pinkish tinge of pus, mixed with a smaller or larger amount of blood. Microscopic examination usually shows red cells as well as pus cells. This test should, of course, be supplemented by an actual examination of the herds in every case.

Tests for *B. coli* in milk are made as ordinary routine procedure in some cities, and various methods are in use for inhibiting the growth of other organisms while favoring *B. coli*. In some laboratories milk is plated on special media, such as the Aesculin bile salt or Endo media, giving color reactions with *B. coli*, or carbolic acid, in weak solutions, and neutral red with bile salt are used as inhibitive agents to organisms other than *B. coli* in fermentation tube tests.

Among pathogenic organisms, Tubercle bacilli are being more actively searched for in milk today than any other. Examinations for tubercle bacilli in milk are reliable only by animal inoculation, and even here cultures must be made from the lesions to rule out Rabinovitch's butter bacillus.

Discussion.—Dr. W. H. Park, New York, said that Dr. Slack had so fully covered the subject that he would omit his paper. Referring to the microscopical method of estimating bacteria in milk, he said it was being used not infrequently, and that it was very useful. As to the leucocyte count, it might occasionally give us quite a little information. He had made some observations recently, which seemed to show that herds having a high fat content in the milk may have a high leucocyte count without there being any disease in the herd whatever. Great importance should be laid upon making control plates of the water and material used. He had not found it necessary to use the porous covers as they had not been troubled with spreaders. In city milk it was very important to use the lower tem-

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peratures of 20° to 27° C., when quick counts were not necessary. In milk kept in cold storage, the low temperature bacteria increase. Where quick work is not necessary the low temperature is better as giving the fuller counts. For Certified Milk this is not so important.

Discussion.—Prof. H. W. Conn, Middletown, Conn., had found, in using the method, that the results generally were as Dr. Slack had stated; they were reliable for most specimens, but his experience had been that once in a while there would be a sample very much in doubt, where the plate would give a different result from the microscopic test. He inquired if that had been Dr. Slack's experience.

Discussion.—Dr. Andrew Wilson, Wheeling, said he hardly felt competent to speak as to dealing with such large numbers, but he had some little experience with the method of Stewart, of which Dr. Slack's method was a modification. He had made about 1,500 examinations, in which he had had accurate knowledge of the farms and surroundings, and of the men handling the milk from stable to customer, and he could emphasize the value of the method. It had proven in their hands eminently satisfactory for ordinary work. They used it in differentiating counts above and below 100,000, and they plate at the same time, and that there is not much variation. It was also valuable in that one could estimate relatively the leucocyte and streptococci count in that way. They had been able to trace back to the herd and find the cow that had mastitis in several instances.

Discussion.—Dr. F. H. Slack, Boston, (closing remarks.) In answer to Prof. Conn's question, I have occasionally found samples where I would estimate a much higher bacterial count than what I would find afterwards, and in most instances I thought it due to the fact that my media were not suitable to the organisms visible under the microscope. I found one, for instance, with many diplococci.

The Character of Milk in Small Communities.

Prof. H. W. Conn, Wesleyan University, Middletown, Conn.

Most of our knowledge concerning the milk supplied to the public has been obtained from the study of milk in the larger

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cities. This has been natural and inevitable. Analytical laboratories for chemical and bacteriological work have been located chiefly in the larger cities. More interest has been centered in the milk for the large population of the city than in the milk supply of the limited population of the town, and there has been no difficulty in obtaining money for work in the larger place; great difficulty in getting it for the smaller community. As a result, while analyses by hundreds of thousands have been made of the so-called "City Milk," little is known today as to the grade of milk furnished to the small town.

There has been a general impression that the small town is better served in respect to this product, than the large city. The source of supply is near at hand; the milk can be delivered fresh, only a very few hours old; the producer is very likely to be the distributor, and naturally will take a pride in the product that he sells; it is possible to trace individual lots of milk to their source, so that the results of improper methods can be traced directly to those responsible. Then there is a general feeling that a dealer will take more interest in his product when he knows his customers than when his milk goes into a general supply, and its identity is lost. For all these, as well as other reasons, it would seem that the small town should receive fresher and more reliable milk than the city.

On the other hand, it is to be remembered, that where epidemics have been traced to milk, it is practically always in small, rather than in large, communities. In the small town, too, the milk inspector is commonly unknown. In these places no one especially considers it his duty to interest himself in the purity of the milk. The small community, while protected by law, is actually not protected in fact. In some instances, it is known that the small town gets the milk that the large city refuses to accept.

Hence the question arises whether the milk of the small town is better or as good as that furnished in our larger cities. At present, however, little information is in our possession in regard to the matter. During the last two years, opportunity has presented itself to study this question. The Connecticut State Laboratory is situated in about the center of a small state, with good express connections so that from a large part of the state

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milk collected in the morning can be delivered in the laboratory by three in the afternoon. This possibility presented the opportunity of offering the services of the laboratory for milk analysis in such towns as could not of themselves undertake such work. Preliminary tests showed that by placing the milk immediately upon ice, it will keep for many hours without any change in bacterial content, so that by shipping immediately in iced cases, the samples of milk from a wide territory can be delivered at the laboratory in practically the same condition that it is collected in the towns from the dealers. Experience has shown that this method is perfectly practical, and that after the collector of the samples has had a little experience, he can furnish the laboratory for analysis, milk in practically the same condition that he collects it.

The samples sent in have been plated for bacteria immediately, the other tests being made as soon as possible. Our methods of analysis have developed nothing new. We use the ordinary methods for determining bacteria, and for fat. To detect watering, we have used the refractometer test, which is very simple and accurate. The examinations made have extended over nearly two years, and have been made at all seasons, winter and summer alike. The samples have been sent from communities ranging from the small village, with its one or two milk dealers, to the small city with its twenty or more dealers, and they thus fairly well represent the milk of the smaller towns of New England.

A general summary of the results of these studies is as follows:

The use of preservatives is very rare, no instance of it having been found in our samples.

The fat is frequently below the legal standard. Five per cent. of our samples have shown less than the legal quantity. This has, however, manifestly not commonly been due to dishonesty, but to carelessness, as is shown by the fact that about an equal number of samples show more fat than is to be expected in any normal milk. The fat percentage has occasionally been as high as ten, and in one case twelve per cent. This clearly indicates carelessness in the mixing of the milk, rather than in-

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tentional fraud, but it indicates emphatically the need of some sort of control.

Watering has occasionally been found, but it is uncommon.

The bacterial content, of course, shows wide variations, ranging from as low as about 1000 to as high as 12,000,000 per c. c.

23% of the specimens have shown over 1,000,000 per c. c.

42% have contained less than 50,000 per c. c.

The numbers have been much higher in summer than in winter, few samples in the winter being over 500,000, and few samples under 500,000 in the summer.

The general average is probably not as high as would be found in a large city, because the nearness to the source makes it possible for the careful dealer to furnish fresher milk with very small numbers of bacteria. These samples bring the average down. The average in summer, however, runs up as high as it is in the city. Considering the fact that these supplies are close to the consumer, so that the milk may be delivered really fresh, the fact that in summer few samples are found under 500,000 bacteria per c. c., points clearly to a condition in the dairies as faulty as is found in the dairies that supply the larger cities, and they certainly indicate a less efficient cooling of the milk. In short, the quality of the milk furnished our smaller communities is not as superior, and probably on the whole, inferior, to that furnished the larger cities.

It has proved to be a difficult matter to get small communities to undertake any kind of milk inspection. To open the purse strings so as to get money to compensate a milk inspector, is almost an impossibility in a small town. The only regularly appointed official who has any right to look into the matter is the Health Officer; and the Health Officers are usually so poorly paid, and so rarely thanked, that they are not very strongly drawn to placing upon their backs another burden involving more work and more enemies. Quite generally they pay no attention to the subject. What is every ones' business is no ones' business, and as a final result, it appears that, at least in the State in question, the public of small communities is pro-

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tected against impurities and frauds in regard to the milk supply only in the statute books, and not at all in reality.

Considering the large part of our population that lives in cities of under 20,000 inhabitants, it becomes a manifest duty of those interested in pure milk to use every influence possible to extend to the smaller communities, the principles that have become so useful in the larger cities.

Dr. Samuel Porter, St. Louis, said that in St. Louis they had recently established a Commission on tuberculosis, and that one of the objects of the Commission is to take up the question of the milk supply in that city, and a part of the work would be to establish milk inspection. He requested that such of the members as have already published papers would send copies to their Commission. They would publish each month, a bulletin, and place it in the hands of the Association. The Commission was called "The Municipal Commission on Tuberculosis."

Dr. George Goodhue, Dayton, of the Milk Commission of the Montgomery County Medical Society, for which Dr. Smith spoke at the morning session, said that they had a Milk Commission which has been established one and one-half years, and which has been very successful in its work. It was in favor with the people and charitable members had taken notice of it and made it possible for the poor to avail themselves of its benefits, as well as the rich. About the same time, he had been appointed on the Milk Commission he was appointed Health Officer of the City of Dayton, and had tried to carry into the work something of the knowledge and experience gained, although he had realized that Certified Milk could only be supplied to a small percentage of the people. They had been trying to improve the general milk supply of Dayton, and had examined something like 30 specimens each day of milk coming into the city and made records of the bacteriological count, and kept them in an open book for the people to inspect and for the dairymen themselves to inspect, and had endeavored to have the newspapers and people using milk call up the Health De-

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partment and find out if the milk of a particular dairyman was considered good, after examination.

They had found no case of the use of preservatives in the milk in Dayton. They found the first month, that 35 were watering the milk; that has been reduced so that for several months not a single specimen of diluted milk had been found. They had also done something along the line of requiring milk to be bottled. Some cities require that milk sold from wagons shall be retailed in bottles; others require only the grocers to do so, but so far as he knows, Dayton was the first city to compel both retailers from wagons and stores to deliver in bottles. That regulation, which was adopted by the Health Board, has been attacked by the dairymen, and temporary injunction gotten out two weeks ago. (It has since been dissolved.)

This work which is being done, resulted from the establishment of this Milk Commission for the Certification of Milk, and had it not been for the enthusiasm started in this way, the Health Board could not have done what it has.

Legislation Relating to the Production and Protection of Certified Milk.

Dr. Floy McEwen, Newark, N. J.

With the affixing of the Governor's signature at 12:15 P. M., on April 21, 1909, the Committee's substitute for Senate Bill No. 251, became a law. This measure, popularly known as Dr. Coit's bill, which on final passage, passed the Senate unanimously, and the Assembly by a vote of 44 to 1, is designed to give legal status to the Medical Milk Commission, and safeguard the results of its disinterested labors. The enactment of this measure is of such far reaching importance that a brief statement as to the bill and its author seems worthy of record.

The Medical Milk Commission movement had its origin in the city of Newark, New Jersey, in 1892, over seventeen years ago. It was planned and pushed to success by Dr. Henry L. Coit, of that city, and the Essex County (N. J.) Medical Milk

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Commission, designed to carry the plan into effect, was organized April 13, 1893.

Fifty-six such Commissions in as many cities are now organized in 22 different States, and all of these Associations have heretofore been voluntary bodies without legal status. The bill just passed establishes such status and safeguards the term "Certified Milk."

It was pointed out that since the original Commission had its origin in New Jersey, and had become an efficient arm of the Public Health, inaugurating as it did, the present widespread pure milk crusade, that the State should protect, by legal enactment, the Commissions in their purely professional and philanthropic labors, and so strengthen their influence abroad as well as conserve the public good.

In the effort to secure the enactment of this measure, every member of the State Legislature was reached either by personal interview or by letters or literature, the author of the bill, Dr. Coit, alone writing over 150 personal letters. Friends of the measure everywhere were appealed to, to assist in this campaign of education, and to see or write to their Senators and Assemblymen.

In the Upper House, the bill was championed by Senator Joseph S. Frelinghuysen, of Somerset, and in the Lower House by Assemblyman Henry C. Hines, of Essex, and it is to the earnestness and personal interest and legislative skill of these two gentlemen that the success of the measure was assured. We take this occasion to thank them and to record our appreciation of the many splendid services rendered by the friends of the measure everywhere. The bill contains permissive and mandatory clauses, and provides for the organization of Medical Milk Commissions; the appointment of their members; defines their powers; establishes standards of milk purity; and protects the term "Certified Milk."

Under this Act, a dairyman is protected who chooses to fulfill the requirements of a Medical Milk Commission. It protects the Medical Milk Commission in its voluntary and unpaid services, and it protects the public against misbranding and deception in the matter of purity of milk.

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The bill, as originally drafted, was passed in the Senate March 31, 1909, by a vote of 12 to 1. It was then sent to the House and amended there April 5, 1909, passing the Assembly April 8, 1909, by a vote of 44 to 1. The bill, as amended, was then returned to the Senate and repassed by that body April 13, 1909, by a vote of 13 to 0.

Considering the fact that the first Commission had its origin with a member of this Association, and that this is the first law anywhere to give legal recognition to the Medical Milk Commission, it seems fitting that the history of the movement should be recorded in our transactions.

In the drawing of the bill, every interest was consulted and safeguarded, and in its present form is regarded as the most important and comprehensive step that has been taken in the pure milk movement since the formation of the first Commission.

The full text of the bill follows:*

The Scoring of Dairies for Raising the Grade of Milk.

Raymond A. Pearson, Commissioner of Agriculture
Albany N. Y.

THE SCORE CARD AS AN AID IN DAIRY INSPECTION.

The so-called system of score card inspection of dairies, which produce milk for consumption in cities and towns is slowly extending. It is based upon common sense, and its advantages in the way of accuracy and fairness, seem to commend it to all who take the trouble to give it careful consideration.

Until the appearance of the score card, little effort was made to classify the almost countless details which have to do with the purity and wholesomeness of milk. The many items requiring attention are now listed, and still better in the score card, they are given numerical values which tend to show their relative values. Thus, with the use of the score card, a competent

* EDITOR'S NOTE—See page 75, Proceedings Second Annual Session.

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inspector not only is able to designate the character of defects obtaining in a dairy, but also he can indicate in no uncertain way, the seriousness of such defects as are found. The use of a score card has been explained to this Association at previous meetings, and need not be repeated here.

When intelligently used, its value is appreciated alike by producers, consumers and authorities. Its great advantage is that it is educational. It brings about improvement by showing the advantages of improvement rather than by resort to police power or threats.

The score card has been used in judging many Certified Milk plants, and not infrequently these have received the score of one hundred per cent. It would seem that this method of inspecting dairies might well be adopted to determine when a dairy is eligible for certification. It is probably true that a score card intelligently used, could be depended upon with better result than the bacteriologist's examination of the milk, if it were necessary to choose between them, which it is not; the two work well together. Frequently the bacteriologist's counts have shown serious defects, but dairies have been allowed to continue in the production of Certified Milk, because it was found that conditions were apparently right at the producing farm, or they were being made right as rapidly as possible. The score card shows the conditions at the dairy farm. It shows these in terms which a dairy man can understand. It uses the language of the dairy man. When he is told that Certified Milk must contain not more than a certain number of bacteria, or that more than this number had been found in his milk, this is very indefinite. What he wants to know is how to proceed to make Certified Milk, or to reduce his bacterial count. An intelligent use of a score card shows this.

It is believed by the writer that it would be an advantage to all concerned if a score card were introduced in connection with the production and supervision of Certified Milk.

Discussion.—Clarence B. Lane, Washington, said as one instance of what the score card has done, he had in mind one place where 100 producers were supplying milk to the city, and

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the score card was introduced, along with other educational features, and inside of one year the rating of the dairies was increased from 35 to 72, or 100%, and that meant that not only the condition of the dairies was improved 100%, but the quality of the milk itself no doubt was improved to that extent, and that was only one example of scores that might be given. As Prof. Pearson has said, the score card is rapidly growing in favor and use, and there are now on record, over 100 cities that are using this system in improving their dairies and milk supplies. There is no question but that the score card system is one of the best methods a Board of Health can adopt in improving dairy conditions.

Discussion.—Dr. George Goodhue, Dayton, said that the first year they had been content with bacterial count as a means of bringing to terms those who were producing poor milk, but at the beginning of this year they had adopted the score card and had placed a map in the Health Office, representing the country, and placed different colored tacks to show the location of different dairymen, so that each could know where he stands relatively with regard to his dairy, and they were getting quite interested in the matter, and it was intended, after a time, to take some note of it, so that those standing highest might receive some reward.

Dr. Andrew Wilson, Wheeling, inquired if there was any difficulty in using these cards, and who does the scoring.

Clarence B. Lane, Washington said that usually the dairy inspector does this work, and the Dairy Division gives assistance to something like 150 cities in introducing the system. When called upon they go to places and spend two or three days, or a week if necessary, assisting the inspector with the method, so that he can soon score with reasonable accuracy. Dr. Evans, of Chicago, now has a whole crew of inspectors doing this work. With the official score card, the directions are so clear that anyone with reasonable intelligence can use them.

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A Plan for Annual CERTIFIED Milk Contests.

Clarence B. Lane, Washington, D. C.

Milk contests are increasing in number and popularity, and they are now generally admitted to be one of the best means of educating the producer and consumer along the line of improving the milk supply. No less than 15 were held last year, two of which were national in scope; 10 were State contests and 3 city contests. The National Certified Milk Contest, held in Cincinnati, was of special interest to Medical Milk Commissions, and all interested in Certified Milk. 24, or practically one-third of all the Certified Milk producers in the country participated. These represented 10 States and Canada. The results as shown in the following tables are of interest:

COMPOSITION AND CONDITION OF CERTIFIED MILK. (Cincinnati Milk Show.)

TABLE I.

No.	Flavor	Fat	Sols. not Fat	Acidity	Bact. per c. c.	Free from Sediment.
1	Excellent	3.8	9.12	0.18	1,100	Clean
2	Good	5.7	9.97	0.20	0	Sl. Sed.
3	Sl. Silage Taste	4.8	8.84	0.19	100	Clean
4	Sl. Foreign Flav	5.8	9.34	0.18	300	Clean
5	Sl. Foreign Flav	5.2	9.21	0.19	500	Clean
6	Excellent	3.8	9.17	0.21	400	Sl. Sed.
7	Excellent	3.6	9.29	0.18	100	Sl. Sed.
8	Sl. Feed Flavor	4.0	9.23	0.18	900	Sl. Sed.
9	Good	3.8	8.34	0.18	400	Clean
10	Sl'tly unclean	5.5	8.99	0.18	300	Clean
11	Excellent	4.2	9.21	0.21	3,000	Clean
12	Good	6.0	9.30	0.19	2,200	Clean
13	Good	4.5	9.57	0.17	4,100	Sl't Sed.
14	Good	3.4	8.99	0.19	5,900	Clean
15	Silage Flavor	3.8	9.04	0.17	7,700	Clean
16	Feed Flavor	5.7	9.11	0.18	8,400	Sl't Sed.
17	Silage Flavor	2.6	8.78	0.18	4,300	Sl't Sed.
18	Excellent	3.8	8.84	0.16	12,900	Clean
19	Sl'tly Grassy	4.3	9.55	0.22	12,000	Clean
20	Excellent	4.2	9.12	0.18	46,500	Clean
21	Foreign Flavor	4.2	8.55	0.16	440,000	Clean
22	Sl'tly Weedy	4.0	9.16	0.19	257,000	Sl't Sed.
23	Excellent	3.2	9.27	0.19	88,000	Clean
24	Bad Odor	2.6	9.65	0.20	26,600	Clean
25	Good	4.6	9.19	0.19	5,000	Sl't Sed.

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The flavor was generally good, only 2 scoring below 35, out of a possible 40. A few samples showed strong silage and grassy flavors. The fat varied from 2.6 to 6.0 per cent., and is open to severe criticism for Certified Milk, the fat content of which is supposed to range within certain narrow limits. Samples showing these extremes certainly did not represent the average product of any herd, and this very clearly shows the need of a different method of securing the samples for these contests.

The solids not fat, varied from 8.3 to 9.97, a range too great for clinical milk.

The acidity was within very narrow limits, viz.: from 0.16 to 0.22 per cent.

The number of bacteria per cubic centimeter, varied from no growth up to 440,000. There is no question but that the high count was due to insufficient ice in packing. One sample sent from San Francisco traveled about 3,000 miles, and when plated, after a week old, contained 100 bacteria to the cubic centimeter. 9 of the 24 samples contained less than 1,000 bacteria to the cubic centimeter, which is a splendid showing, considering the long distance much if it was shipped, and the fact that it was not plated until about a week after it was drawn.

Two-thirds of the samples contained no foreign matter, as far as could be detected, and the remainder only a very slight amount of sediment.

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**NUMERICAL SCORES OF CERTIFIED MILK.
(Cincinnati Milk Show.)**

TABLE II.

No.	State	Flavor (40)	Comp. (25)	Bacteria (20)	Acidity (5)	Free from Sedi- ment. (10)	Total Score (100)
1	N. Y.....	38½	24	19	5	10	96½
2	Pa.....	36½	25	20	5	9	95½
3	Ohio.....	35	25	20	5	10	95
4	Canada.....	35	25	20	5	10	95
5	N. J.....	35	25	20	5	10	95
6	Pa.....	37	24	20	4	9½	94½
7	Cal.....	37	23	20	5	9½	94½
8	N. Y.....	35½	25	20	5	9	94½
9	Mo.....	36½	23	20	5	10	94½
10	Wis.....	34	25	20	5	10	94
11	Ohio.....	37½	25	17	4	10	93½
12	Mass.....	35½	25	17	5	10	92½
13	Cal.....	36	25	15	5	9½	90½
14	N. Y.....	36½	22	14	5	10	87½
15	Pa.....	35½	24	12	5	10	86½
16	Ohio.....	36	25	11	5	9	86
17	Ohio.....	35½	19	15	5	9½	84½
18	Pa.....	37	24	8	5	10	84
19	Ky.....	36½	25	9	3	10	83½
20	Ky.....	37	25	0	5	10	77
21	N. Y.....	36	25	0	5	10	76
22	Ky.....	36	25	0	5	9½	75½
23	Mo.....	37	21	0	5	10	73
24	Mich.....	33	19	3	5	10	70
25	Va.....	36	25	20	5	9½	95½

The total scores varied from 70 to 96½, and averaged 88. Thirteen scored above 90.

OUTLINE FOR ANNUAL CONTEST.

In view of the fact that this Association and that of the Certified Milk Producers are interested in these contests to the extent of offering valuable silver cups for the highest scoring milk, I have been asked by your Secretary, to present a plan to you, and have a general discussion upon the methods of conducting such contests and if possible secure some definite action

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regarding it. There seems to be only one flaw in the way these contests have been conducted in the past, and that is, in the method of securing samples for these contests. The producer has prepared these in the past, in his own way, and as I have already indicated, they have not in all instances represented the product as ordinarily delivered. When this method is followed, there is a strong temptation for some to take extra pains with the sample submitted.

In fairness to all concerned, therefore, it seems wise to have the samples for competition collected in a manner similar to the present plan of your Commission for laboratory analysis. I would therefore suggest the following:

PLAN FOR ANNUAL CERTIFIED MILK CONTESTS.

CONDITIONS FOR ENTERING CONTESTS.

All Certified Milk producers desiring to enter the Contest shall fill out the entry blanks furnished for the purpose.

Collecting Samples.—Samples of Certified Milk to compete in the contest shall be collected from the delivery wagons serving customers, on the date specified, by a representative of the Milk Commission certifying the product. Samples shall be packed in ice and shipped by express at the expense of the producer.

Scoring.—The scoring shall be done by competent judges, and the scores shall be based upon the score card adopted for this purpose.

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SCORE CARD FOR CERTIFIED MILK.

Exhibitor

Address

Numerical Score.

Perfect	Flavor	Composition	Cleanliness			Total
			Bacteria	Acidity	Free from Sediment.	
	30	20	30	10	10	100
Judge's Score						

Descriptive Score.

Flavor	Composition	Bacteria	Acidity	Free from Sediment.
Excellent Good Fair Bad	per cent.	Total Liquifiers.. per cent.	Sediment
Flat Bitter Weedy Garlic Silage Smothered Unclean Soap Other taints	Fat Solids not fat.....			(Deductions may also be made for improper package.)

Remarks

Date

(Signature)

Judge

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DIRECTIONS FOR SCORING.

Flavor.—If rich, sweet, clean and pleasant, with no foreign odor, score 30 (perfect). Deduct for objectionable flavors and odors according to conditions found.

Composition.—If fat content is between 3.75 and 4.25 per cent., score perfect (20). Deduct 1 point for each one-fourth per cent. variation from this, either above or below, unless a definite per cent. is specified on the package. If 8.25 per cent. solids, not fat, or above, score perfect. Deduct 1 point for each one-fourth per cent., or fraction thereof below 8.25.

Bacteria.

Less than	500 per cubic centimeter.....	30 (Perfect)
	500 to 1,000 per cubic centimeter.....	29 (Perfect)
	1,000 to 1,500 per cubic centimeter.....	28 (Perfect)
	1,500 to 2,000 per cubic centimeter.....	27 (Perfect)
	2,000 to 3,000 per cubic centimeter.....	26 (Perfect)
	3,000 to 4,000 per cubic centimeter.....	25 (Perfect)
	4,000 to 5,000 per cubic centimeter.....	24 (Perfect)
	5,000 to 6,000 per cubic centimeter.....	23 (Perfect)
	6,000 to 7,000 per cubic centimeter.....	22 (Perfect)
	7,000 to 8,000 per cubic centimeter.....	21 (Perfect)
	8,000 to 9,000 per cubic centimeter.....	20 (Perfect)
	9,000 to 10,000 per cubic centimeter.....	19 (Perfect)
	10,000 to 12,000 per cubic centimeter.....	18 (Perfect)
	12,000 to 14,000 per cubic centimeter.....	17 (Perfect)
	14,000 to 16,000 per cubic centimeter.....	16 (Perfect)
	16,000 to 18,000 per cubic centimeter.....	15 (Perfect)
	18,000 to 20,000 per cubic centimeter.....	14 (Perfect)
	20,000 to 25,000 per cubic centimeter.....	12 (Perfect)
	25,000 to 30,000 per cubic centimeter.....	10 (Perfect)
	30,000 to 35,000 per cubic centimeter.....	8 (Perfect)
	35,000 to 40,000 per cubic centimeter.....	6 (Perfect)
	40,000 to 45,000 per cubic centimeter.....	4 (Perfect)
	45,000 to 50,000 per cubic centimeter.....	2 (Perfect)
	over 50,000 per cubic centimeter.....	0 (Perfect)

When an unusually large number of liquifying bacteria are present, further deduction will be made.

Acidity.—If 0.20 per cent., or below, score perfect (10). Deduct 1 point for each 0.01 per cent. above 0.20 per cent.

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Appearance of Package and Contents.—If package is clean, free from metal parts and no foreign matter can be detected in the bottom of the bottle, score perfect (10). Make deductions according to conditions found.

Discussion.—Dr. Henry L. Coit Newark, N. J., stated that in the report he had made for Council, he had omitted to say that the Council considered the subject of Annual CERTIFIED Milk Contests; that they had approved of the plan, suggested by the secretary, which was that this Silver Cup owned by the Association should, each year, be handed to the producer of CERTIFIED Milk receiving the highest score in the Annual CERTIFIED Milk Contest; that the members of Council would be called upon to determine which cities of those holding Milk Contests, should be the one in which the National CERTIFIED Milk Contest should be a part. Dr. Coit further reported that the CERTIFIED Milk Producers' Association in similar manner would offer annually, their silver cup, as a second prize in the National CERTIFIED Milk Contest. It would follow that these cups would be held, therefore, by the winners until the next National CERTIFIED Milk Contest.

The plan of collecting samples through a representative of the Milk Commission, as suggested by the essayist, met his approval in that it precluded the possibility of a producer not under the supervision of a Medical Milk Commission entering his product in the Contest as CERTIFIED Milk. The motion was made and carried, that collection of samples for these Annual Contests be done under the direction of the Dairy Division of the U. S. Dep't of Agriculture, and that the character of the score card to be used in judging the milks shall be agreed to by the Council of this Association, and that the Cup shall be competed for only by producers of CERTIFIED Milk, who are under the Milk Commissions of this Association.

Dr. Coit, in speaking of the Milk Show recently held in Cincinnati, stated that 24 CERTIFIED Milk Producers entered the Contest for that grade of milk, while 65 producers of Market Milk entered their product. The Civic Organizations had joined with the Milk Commission in making the Milk Show a great

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success. About 20,000 people visited the exhibition, and it is safe to assume that the educational advantage derived therefrom, was very great. A Dairy Institute for the instruction of the producers, made this plan most complete.

Discussion.—Dr. W. H. Park, New York, said that Certified Milk varies from other milk in its safety rather more than in its elegance, and personally, he would reverse the order of “flavor” and “bacteria,” making that of “flavor” rather less than 20. The movement was one to furnish a safe, wholesome milk, and that should be kept in view by the producer as well as by the Commission.

Dr. Samuel McC. Hamill, Philadelphia, thoroughly endorsed Dr. Park’s remarks.

Prof. Raymond A. Pearson, New York, called attention to this point, that it might be well in competitions of this kind to allow the character of equipment, which stands behind the production of pure milk, to be considered in this score card, thus making it possible for a man, for instance, to take a cow out on a special grass plot and then get a sample of milk on a certain day when the conditions would be unusually good.

Mr. Lane thought this a very good idea, and said that the only reason it had not been done was because of the difficulty of scoring dairies in so many different cities within a few days’ time. He thought it might be better for that to appear on a separate card. As to the possibility of a man taking a cow out on a special grass plot and getting an unusual sample to send in, that was just the thing they were trying to avoid, and that if the inspector collects the sample from the wagon on the street this unfairness would be prevented.

The Relation of the Medical Milk Commission to the Establishment and Conduct of Infants’ Milk Depots.

Dr. J. W. Kerr, U. S. Public Health and Marine Hospital Service, Washington.

While stationed in Hongkong, I was impressed with the enormous death rate among infants and children in that city.

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The Health Officer, in his annual report for that year, stated that only 72 children out of 1,000 born, lived to be a year old. This almost unbelievable statement was the cause formerly, of my interest in the question of infant mortality. That it is too high generally, is a well known fact, and as a result, Infants' Milk Depots have been organized in at least 22 cities of our country.

It is not the province of the Federal Government to maintain Infants' Milk Depots, but during investigations of milk in its relation to the public health, it became necessary to make inquiry as to the extent of this movement, and the influence it has had in reducing infant mortality. I believe that the idea of such a philanthropy can be traced to the Consultations de Nourrissons, which had for its object the encouragement of maternal feeding and care of infants. So far as I am able to determine, however, the idea of distributing milk, especially for the use of infants, from a central station, was carried out by Dr. Koplik, at the Good Samaritan Hospital, New York, in 1889. A similar institution was opened in Hamburg during the same year. The first institution of the kind opened in France, was popularly designated "La Goutte de Lait," a term that has had its influence in popularizing this movement in other countries, but the idea is the same, and the object of all such institutions is the saving of infant life.

With the view to determining the extent of this work in the United States, and its influence on the public health, inquiry was made of the Health Officials of all cities in the United States containing a population of over 50,000. Replies were received from practically all of the cities in this class, and the information was tabulated and published in bulletin No. 41, of the Service. These tables contain the names of 22 cities in which Infants' Milk Depots were in operation during the years 1907 and 1908. So far as I have been able to determine, there are now at least 159 Milk Depots being maintained in the United States. In addition to this number, there are undoubtedly many hospitals throughout the country which dispense milk in connection with an out-door clinic, but which do not make a special feature of this work. Definite facts regarding such institutions have thus far not been obtainable.

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In Rochester, N. Y., Cambridge, Mass., Cincinnati, Ohio, and Jersey City, N. J., depots were maintained at public expense in 1907, and supervised by officials of the municipality.

In the inquiry referred to, it was of primary interest to determine the character of milk used, whether it was modified under professional supervision, whether it was pasteurized, and the method followed, and the amount distributed. In seven out of twenty-two cities heard from, "Certified Milk" was used, and in all of the cities, the milk came from sources of undoubted purity. In most of the depots, the milk was modified under medical supervision, to meet the special needs of infants. Pasteurization was practiced in Infants' Milk Depots of ten cities of a portion or all of the milk distributed, every depot having its own requirements as to pasteurization. It is a singular fact that a method which saved the wine industry of France and which has been so commonly used to safeguard milk, should be so loosely employed, and for so long a time.

It is of interest to inquire into the slight differences of procedure carried on in different cities. While all have the same object, decided opinions prevail as to the relative importance of the different steps employed. In one city, the work is being carried on by independent agencies, while in another, wise provision has been made for the cooperation of the various associations interested in the improvement of the poor.

In one city there are numerous independent stations, while in another, there is one central station with sub-stations, scattered here and there, the milk being transferred from one to the other by means of refrigerating wagons.

In one city, only raw milk is used, and there is decided opposition on principle, to pasteurization, while in another city, it has been found necessary, on account of transportation problems and lack of facilities, to use only pasteurized milk.

In one city, the distribution of milk is wholly relied upon to accomplish the end for which the station was established, while in another city, the distribution of milk is combined with settlement work.

Finally, in one city, an enlightened government and public opinion have undertaken to do its duty, whereas, in another

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city, where the needs are fully as great the solution of the problem depends upon philanthropy.

I have been especially interested in the work of the New York Milk Committee, and the excellent results obtained. The three experiments made should be of special interest to institutions of like character. In the words of the Committee, itself, the first one indicates that "until the system of handling even Certified, or Guaranteed, milk has been reduced to the highest state of perfection from the farm to the consumer, the milk for infant feeding should be pasteurized." At the same time, they state that "the question of pasteurizing milk, or using it in the raw state, is of minor consideration compared to the instruction of the mother and the care she gives her infant."

A statistical statement regarding the influence of milk depots in a community with one or two exceptions, is out of the question. In cities such as Newark, N. J., where the work has been carried on for years under one management, and where careful record is kept of the milk dispensed, and the infants fed, it is possible to express the reduction in infant's mortality in percentages. For instance, on 1907 the Babies' Milk Dispensary in that city sent out over 258,000 bottles of milk, fed over 500 infants of the poor, and reduced the mortality of these babies to six per cent. This low mortality is in striking contrast to the enormous figures given by the Health Officer of Hong-kong, and are sufficient testimony as to the benefits of Infants' Milk Depots. The comparison of statistics referred to above, however, are only made to emphasize two extremes, as conditions in the two cities named are not comparable.

While Infants' Milk Depots are primarily of great value, to infants themselves, such institutions appear to me to afford facilities for co-ordination of public health activity under the direction of constituted authority.

There is no doubt as to the value of Certified Milk, but it seems to me that its field of usefulness would be greatly extended if it were distributed through the agency of the infants' milk depot.

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Discussion.—Dr. Albert Merell, St. Louis, said that he represented a Commission that made its beginning with the distribution of milk, modifying it and distributing it through stations and giving it to mothers who presented prescriptions from physicians, indicating the particular modification required. The milk was in the first place as good as could be found, and as good, except in some particulars, as most of the Certified Milk. It was modified, bottled in sterile bottles, covered, and held at temperature of about 45 at the stations where the mothers came with their prescriptions for it. They had found, so far as the infants supplied by these dispensaries, five in number, were concerned, that the death rate had been greatly reduced. They sell the milk to the beneficiaries at one or two cents a bottle to keep them from feeling that they are being pauperized.

Dr. G. C. Schaeffer, Columbus, said that this was a subject in which he had been interested because they had been doing a good deal of work along this line in Columbus. The work started with a trained nurse, who secured a gift of one thousand dollars to start it. She rented a small place and started the work alone as a free dispensary for poor babies. He had been connected with the dispensary which had grown until today they had two trained nurses, aside from a superintendent, and in connection with the Visiting Nurses Association, they were caring for practically all the poor babies of the city, and had them under their supervision. They were sending out between 3,000 and 4,000 bottles of Modified Milk a week. Since the first donation of one thousand dollars, they had had others, and the dispensary was in a quite good financial condition. They were going a little bit further than the dispensary idea of furnishing milk to the poor alone, modified to suit the individual case, and were furnishing it to those able to pay the regulation price. They had taken the place of the Walker-Gordon Laboratory. It was a good work, and the Milk Commissions would do well to aid in such work wherever possible. Their own Commission had arranged with the dairymen to rebate for caps and seals on all milk sold to the babies' dispensary, and he was mak-

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ing reduced rates to the dispensary, so that they were now giving Certified Milk to their patrons.

The House of Delegates reported the election of the Officers nominated by the Council.

The Committee appointed to audit the treasurer's report stated that their examination of the books had shown everything to be correct.



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PROGRAM—THIRD SESSION.

Address by the President.

ROWLAND GODFREY FREEMAN, M. D., New York City.

The Bearing of Communicable Diseases on the Pure Milk Movement.

JOHN W. KERR, M. D., Assistant Surgeon General, U. S. Public Health and Marine Hospital Service, Washington, D. C.

Some Comments on Prof. Koch's paper at the International Congress on Tuberculosis,

E. C. SCHROEDER, M. D., Superintendent of the Experiment Station, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

The Relative Importance of Human and Bovine Types of Tubercle Bacilli in Tuberculosis in Man,

WILLIAM H. PARK, M. D., Director of the Research Laboratory of the New York Department of Health.

Municipal Regulation of the Production and Sale of Market Milk.

THOMAS DARLINGTON, M. D., Commissioner of Health of the City of New York.

ADJOURNMENT.

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Dr. Henry L. Coit announced for the Council that two additional guests had been elected to sit with the Conference during its sessions: Dr. John Guiteras, Havana, Cuba, and Dr. H. E. Stevens, Kearney, N. J.

He also announced that a new Milk Commission has been organized at Wilkesbarre, Pennsylvania, making 57 at the present time.

Address of the President.

Dr. Rowland Godfrey Freeman.

Enthusiastic for improvement in dairy hygiene is the source of the large attendance at our meetings, and it is this alone that brings to our annual sessions delegates from all parts of the country. This enthusiasm is brought about by our hope, through better conditions, of obliterating the fatal results of dirty dairy methods.

I have been in the habit of dating dairy hygiene in this country from the time of Coit, and I have done this without a very exact knowledge of what had been attempted or accomplished in earlier times. A recent article by Hanauer* gives us some idea of this development, up to the middle of the last century, and from this I am quoting freely in what follows:

Going back to the early records, we find reference to milk as a food, but little evidence of an appreciation of its dangers.

The Bible refers to the land of Canaan as a land flowing with milk and honey, and again in Ezekiel (XXV. 4) it is threatened

*Zur Geschichte der Milchhygiene bis zur Mitte des vorigen Jahrhunderts.—Separatabdruck aus der Hygienischen Rundschau 1908, No. 20.

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that the men of the east will come and "drink thy milk," in Deuteronomy, (XXXII. 14) "the butter of kine and the milk of sheep," was referred to; in Proverbs (XXVII. 27) "And thou shalt have goats' milk enough for thy food, for the food of thy household, and for the maintenance for thy maidens."

In Greek and Roman literature there are references to cow's milk, the milk of sheep and goats, also mares, the latter being used fermented.

During the middle ages there did not exist the milk trade as at present, for people lived largely in small communities where they, for the most part, produced themselves their own supplies and kept either a cow or a goat as a source of their milk.

One of the earliest records of the appreciation of the dangers that may exist in the consumption of milk occurred in Venice in 1599, where the Senate, on account of a serious epidemic, forbade, under penalty of death, the sale or use of butter, milk or cheese.

Again in 1682, an edict was issued that on account of an epidemic among cows, the milk should be poured on the ground and buried. And again, in Braunschweig-Lüneburgische, in 1732, there was an edict to the same effect, which also states that the milk from these cows was of a yellowish-red color, or with yellowish-red streaks.

Perhaps the first indication of the sort of cleanliness of milk and dairies which we consider essential for the production of safe milk is contained in an encyclopedia published in 1739. This states that "milk from old cows, or cows produced for beef is not good; that good milk must be either white or yellow, not green or blue; that the cows must not only be properly fed, but that the straw they are given must be clean straw; that the milkmaids must not only keep themselves clean, but also the utensils, and that after milking, the milk should be filtered through a cloth, and it also states that milk produced in an uncleanly manner will easily become sour.

A test for milk was to allow a drop to fall on the finger nail, where it must remain round, and not immediately flow off.

A milk ordinance in Paris, in 1742, regulates the feeding of animals used for milk production, including cows, goats, and

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asses. Spoiled malt is interdicted, and the use of any poisonous food, while the milk dealers were forbidden to sell milk that was watered or colored with egg, or that was sour or injurious to the health.

The first reference to the relationship of milk to infant mortality, is contained in a decree issued in Vienna, in 1792, which states that the adulteration of milk is especially injurious to young children, and that in the city and its environs, a much larger number of children die than should be expected from their general condition.

It is said that the first attempt to put hygiene on a scientific basis was the work of John Peter Frank, at the end of the eighteenth century, and he is especially clear and precise in what he has to say about milk and its relation to the health of children. "Milk should not be handled in vessels of zinc, lead, copper or brass, that in Paris, where milk is handled in copper vessels, frequently whole families are poisoned with verdigris." He mentions the influence of bad feeding on milk as denoted by its smell and taste, also through feeding certain noxious weeds to cows. He discusses the stabling of cows and says that those who sell milk should have clean, well-lighted and healthful stables; that they should give the cows fresh feed or pasture them, which latter method gives the cows healthful exercise. He says that colostral milk should not be sold nor watered milk, which does not contain the nourishment of full milk. Milk should be examined for the addition of meal, and the milk of sick cows should not be sold. Frank quotes Timaus von Guldenklee, who mentions a case of a cow that was bitten by a mad dog, stating that the farmer and all those who drank the milk contracted rabies; that eleven persons died, and that only the farmer and his youngest child survived.

The determination of the specific gravity of milk by a lactometer, was introduced by a Frenchman, Cadez de Vaux, and was introduced into Germany in 1804; while in England an apparatus devised by Sir Joseph Banks was used for determining the amount of cream. In Vienna, in 1802, the daily examination of milk was undertaken and those adulterating milk were punished.

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Although a milk ordinance was introduced in Hamburg, in 1818, Nicoli writing in 1835, complains that most of the milk sold is diluted with water.

A book of some importance entitled "An Historical, Scientific and Practical Essay on Milk, as an Article of Human Sustenance; with a Consideration of the Effects Consequent Upon the Present Unnatural Methods of Producing it for the Supply of Large Cities," by Robert M. Hartley, was published in New York, in 1842. Mr. Hartley, who was a prominent citizen of this city, at that time lost a child who was being artificially fed, and whose death was attributed to the quality of milk used. He, in his grief, undertook a very considerable investigation of the milk supply of New York, and as a result, he published this book of three hundred and fifty pages.

He found that seven-eighths of the milk sold in New York was from cows fed on distillery slop. The New York milk supply at that time was 60,000 quarts a day, which sold at an average of six cents a quart. The many large distilleries near the city had established stables adjacent to their plants. In the case of one distillery, the stable is said to have housed two thousand head of cattle. The stalls were rented by the proprietor to the owners of the cattle for from four to five dollars a year each, and the distillery slop was sold at nine cents a barrel, one barrel being the complete rations of a cow for a day. No other food or water was given to the cows. These stables were dark, dirty, and crowded, and the cows were never removed from the stalls, remaining there until they sickened and died. An existence of sixteen to eighteen months is said to have been the maximum. Their teeth rotted and they are said to have developed one of several diseases.

Mr. Hartley makes a considerable argument for the bringing of milk from good farming districts, thirty to forty miles away, and quotes the experience of Boston in getting milk from Worcester, which is forty miles distant.

This book contains a very full description of a Glasgow dairy plant which had been in existence since 1813, a plant with one hundred cows, with a cellar beneath the stable into which the

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manure was emptied, and where grooming of the cows was practised. Apparently this model farm was very successful.

It was some time after this, before much real interest was aroused in our milk supply and dairy conditions. It was not until about 1880 that a real fear of milk as a food became apparent. This followed the discovery of the very large contamination of milk by bacteria; of the many severe epidemics caused by milk, and of the large infant mortality during the summer, which was for the most part confined to artificially fed children.

As I have said, the development of dairy hygiene in this country may be dated from the activity of Dr. Coit, who gave us a means not only of controlling milk production, but also of obtaining scientific investigations of the contamination of milk, and while this scheme was promulgated sixteen years ago, we are only now beginning to see a widespread movement for its expansion.

The same movement, however, is taking place in other countries, and no better evidence of the importance that this has assumed among thoughtful and scientific people is seen than the large books on milk and its production which have appeared. The first of these on the "Bacteriology of Milk," by Swithinbank, and Newman, was published in England in 1903. This was followed a year ago by the publication of the Marine Hospital Hygienic Laboratory of the large and exhaustive work on "Milk and Its Relation to Public Health," with which we are all familiar, and which we must all frequently consult; while there has now just appeared a larger work than any of these, a "Handbuch der Milchkunde," edited by Dr. Paul Sommerfeld. So that this movement which this Society represents in this country is widespread among all enlightened communities, but nowhere, I believe, has it attained a greater state of perfection or produced as much general interest as it has in this country.

The Bearing of Communicable Diseases on the Pure Milk Movement.

Dr. John W. Kerr, Washington.

The conference report relative to the medical examination of employees handling Certified Milk, which was presented by Dr. Henry L. Coit, and adopted as an advisory report by the Association of Medical Milk Commissions at the morning session, has quite anticipated the brief statement which was prepared by me for presentation this evening.

It was intended however, only to emphasize in one or two particulars the bearing of the communicable diseases on the pure milk movement. The subject had previously been presented to this Association, and the action now taken in prescribing advisory regulations indicates that the dangers of the transmission of communicable diseases through the agency of Certified Milk are being met.

The pure milk movement was started primarily to secure safe milk for the use of infants and invalids, but it is capable of extension, so as to become a powerful agent to aid public Health Officials in securing improved sanitation generally.

The fact that pure milk can be produced under prescribed methods must be of great assistance to sanitary authorities, charged with the prevention of communicable diseases, but in order to avoid the opposite effect in the community, great care should be taken that Certified Milk shall in no instance be the carrier of such diseases.

The sanitarian and the physician both have the same object; that is, the production of safe milk. The sanitarian, however, by reason of his official position, is having his attention more frequently called to the dangers of milk as an agent in the transmission of communicable diseases, whereas, physicians having the medical care of infants, are constantly being made aware of the dangers of milk that is dirty and unwholesome. That the recognition of this latter fact has resulted in the extension of the present pure milk movement, is shown by the organization of new Medical Milk Commissions, the holding of pure Milk

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Exhibits, and the offering for sale of Certified Milk on railroad trains and in other public places.

It is very unfortunate that only a very limited supply of Certified Milk is being produced, and that at an increased cost. Its availability to the general public, and especially to tenement house populations, must remain a hope of the future, except as it is placed at the disposal of infants through the agency of the Infants' Milk Depot.

It is all the more important therefore, that no outbreak of a communicable disease should be traced to Certified Milk, and that it should be an ideal in this respect, as well as in a low bacterial count.

Epidemiological data are rapidly accumulating, which go to show that the dangers of milk as a medium for the transmission of communicable diseases has probably not received in general, the attention that it deserves, and that too much reliance in this respect has been placed on ordinary dairy inspection as conducted at the present time.

Tubercle Bacilli Often Present in Market Milk.

It has been known for years that tubercle bacilli may be found in market milk. Past Assistant Surgeon J. F. Anderson, of the Public Health and Marine Hospital Service, during the summer of 1907, examined in the Hygienic Laboratory 223 samples of market milk of the City of Washington, and showed that fifteen of them, or 6.72%, contained tubercle bacilli virulent for guinea pigs. (a) The samples of milk in question came from 102 dairies, 11 of which were definitely proven to have been peddling tubercle bacilli among their customers.

Past Assistant Surgeon J. W. Trask, of the same Service, has compiled a table (b) containing the names of 25 investigators who examined 7097 samples of market milk. Of this number of samples 594 were stated to have contained tubercle bacilli.

These figures represent conditions in a number of different

(a) Anderson, J. F., Bull. 41, Hyg. Lab. U. S. P. H. & M. H. S.

(b) Journal A. M. A., Oct. 31, 1908, p. 1491.

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countries, and may therefore be taken as a fair index of the contamination of milk supplies with tubercle bacilli. With from 15% to 40% of dairy cattle infected with tuberculosis, such results could only be expected. Now that it is generally accepted that bovine tuberculosis is transmissible to man, one thing is sure—milk containing live tubercle bacilli should not be sold for human consumption. This is already accomplished so far as Certified Milk is concerned, but the elimination of tubercle bacilli from market milk can only be had at great expense, and any attempt to do so must take into account the destruction of the infected animals themselves.

Diphtheria Bacilli Sometimes Spread by Milk.

As is well known, diphtheria may also be spread through milk, as may scarlet fever and a number of other communicable diseases.

Trask has cited several investigators who have actually isolated the diphtheria organism from market milk. He has also compiled tables of 53 reported outbreaks of diphtheria, and 125 outbreaks of scarlet fever attributed to infected milk.

The peculiar danger of transmitting diphtheria through milk lies in the well known fact that germs of this disease may persist in the throats of persons who have had the disease for months and even years. One case of this kind has recently been reported by Harper, of Wisconsin, in which diphtheria bacilli were proven to have persisted in the throat of a child for over 600 days. (c) It is a wonder therefore, that more cases have not been directly traced to infected milk, since the conditions are so favorable for its contamination.

Typhoid Infection Often Contained in Milk.

Of even greater importance is the contamination of milk with typhoid bacilli. These organisms have been actually isolated from market milk, and Trask has compiled tables of 317 typhoid outbreaks, reported as spread through this agency. (D.)

(c) Transactions 6th An. Conference, P. H. & M. H. S.

(d) Bull. 41, Hy. Lab. P. H. & M. H. S.

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To my mind these findings are the most serious indictment that has been brought against milk from a public health standpoint. Further evidence of a similar character has been brought forward as the result of recent scientific studies of typhoid fever made by the Public Health and Marine Hospital Service. On account of my executive duties in respect to the scientific investigations of the service, I have been brought in close touch with these studies, and they appear to me to be of the greatest scientific as well as practical value in relation to the milk problem and its solution.

During the past three seasons, comprehensive investigations into the origin and prevalence of typhoid fever in the District of Columbia have been going on; the primary object being to determine the causative factors in the spread of the disease with the view to recommending appropriate remedial measures.

During the first season, that is, from June to November, 1906, 886 cases of the disease were studied and reported upon by Rosenau, Lumsden and Kastle, and of this number at least 85 were attributed to the use of infected milk. (e) Three distinct outbreaks occurred on as many different milk routes.

The board, in presenting its report, expressed surprise that more cases of illness were not attributable to dirty milk, as the conditions under which the milk was purveyed were found to be open to serious criticism, and numerous opportunities of contamination were observed from the farm to the consumer.

During the second season, or from May 1 to November 1, 1907, precisely similar epidemiological studies of 523 cases were made by Dr. Lumsden, with the result that 48 cases were attributed to infected milk. (f)

The board reported that 31 of the 48 cases traced to milk occurred during one distinct outbreak, and the opinion was expressed as a result of the season's observations, that infected milk was one of the important known factors in the spread of typhoid fever in the District of Columbia.

During the third season, or from May 1 to November 1, 1908,

(e) Bull. 35, Hy. Lab. P. H. & M. H. S.

(f) Bull. 44, Hy. Lab. P. H. & M. H. S.

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similar studies were again made by the same officer of 542 cases of typhoid fever, 52 of which were attributed to infected milk. (g)

Lumsden and Woodward have reported that the 52 cases in 1908 occurred during one outbreak in the autumn, and that they were traced to a bacillus carrier. (h)

The person harboring the bacilli was a woman on the farm from which the milk came, and she had had much to do with handling of the milk. This woman was well—as were all her associates on the farm, but on examination, it was found that she was discharging typhoid bacilli in her stools, although she had not had symptoms of the disease for over 18 years. The outbreak as reported, is extremely interesting, as it indicates that milk borne typhoid may be explosive in character, as are water borne epidemics.

In the District of Columbia there occurred within two years and a half, no less than 185 cases of typhoid fever, the infection of which was carried by milk. In other words, approximately 10% of the typhoid fever that occurred was traced to contaminated milk, and the prevention of such contamination was not within the power of the Health Officer with the facilities at hand.

The third season's cases have special significance, as they demonstrate the futility of ordinary dairy inspection as a means of eliminating entirely, the danger of typhoid fever and other communicable diseases from market milk. It is not the intention to minimize in the least, dairy inspection, but it is necessary to recognize its short-comings, and this is shown by the fact that no amount of ordinary inspection would have prevented those 52 cases.

Assuming that the average case of typhoid fever lasts 30 days, the infected milk responsible for the 185 cases referred to above, cost 5550 days of illness.

If stated in dollars and cents, and computed for the entire country instead of the District of Columbia, the figures would have a more striking effect on the public, and emphasize the economic aspect of the milk problem at the present time.

(g) Bull. 52, Hy. Lab. P. H. & M. H. S.

(h) Jour. A. M. A., March 6, 1909.

Typhoid Fever More Common Among Milk-fed Population.

The studies of typhoid fever in Washington, have brought out the fact that the disease in that city is most prevalent among children, which is contrary to the opinion usually held that typhoid fever is a disease of early adult life. In other words, the burden of typhoid fever falls heaviest upon the milk drinking portion of the population.

While the origin of every case among children could not be definitely traced, it must be assumed, in view of the definite findings reported, that milk was the agent of transmission in a large proportion of such cases. Further, the infection among children is more likely to spread, as there is much more intimate and prolonged contact at this period of life, because of their more tender years and consequent dependency.

The facts collected render evident the necessity of taking into account the communicable diseases as they affect milk more than has been done in the past.

While "Certified Milk" or Inspected Milk is certainly more liable to contagion than market milk, its freedom from infection cannot be absolutely guaranteed unless special examinations are made of the dairy personnel with a view to detecting the presence of bacillus carriers.

Bacillus Carriers Not Detected During Ordinary Dairy Inspections.

The worst outbreak of milk borne typhoid fever that occurred in Washington during the past two and one half years, was traced to an apparently healthy woman, who in reality was a living reservoir of typhoid infection.

The demands for low bacterial counts and absence of tubercle bacilli have been met in the production of "Certified Milk"—a most gratifying result—but it would appear from the recent epidemiological studies that similar demands should be made with respect to the absence of the infections of typhoid fever and the other communicable diseases.

In order to detect communicable diseases and possible bacillus carriers among persons handling the milk, special physical

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and bacteriological examinations would have to be made. These appear to me to be entirely feasible, and it is suggested that they be made a requirement in future contracts between dairy-men and Commissions.

By thus supplementing ordinary dairy inspection, freedom from the communicable diseases can be secured. Furthermore, such routine examinations of a large number of individuals engaged in the same occupation would give additional data as to the percentage of apparently well persons harboring the typhoid bacillus.

In the meantime, health officials, if they are unable to adopt the same precautions with respect to public milk supplies, must be alive to the necessity of destroying the infection after it has gained access to the milk. In other words, until the tuberculin test can be universally enforced, and until such thorough supervision of dairies can be maintained as to exclude communicable diseases, there appears to be no alternative except to pasteurize market milk if it is to be rendered safe.

Some Comments on Prof. Koch's Paper at the International Congress on Tuberculosis.

Dr. E. C. Schroeder, Superintendent of the Experiment Station,
Bureau of Animal Industry, U. S. Department
of Agriculture, Washington.

At the meeting of the American Association of Medical Milk Commissions, a year ago in Chicago, I presented a paper in which I endeavored to show the weakness of the arguments used by those who contend that bovine tuberculosis is a factor of little or no importance for public health. Since that time the tri-annual meeting of the International Congress on Tuberculosis was held at Washington, D. C. This Congress, which is the greatest coalition of widely different forces for the purpose of fighting a disease the world has witnessed, it is interesting to

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know, almost unanimously expressed the conclusion that bovine tuberculosis, or tuberculosis among dairy cows, the germs of which are disseminated in milk and dairy products, is a menace to the public health of altogether too much importance to be ignored or neglected.

Dr. Robert Koch, the originator of the views that human and bovine tuberculosis are distinct and separate diseases, and that bovine tuberculosis is so rarely transmitted to persons that it must be regarded simply as an economic condition, of interest to animal industry but of no special significance for public health, personally attended the meeting of the Tuberculosis Congress at Washington, and practically reiterated his former views in a paper read before a joint session of Sections I & VII. It is Dr. Koch's paper here referred to, printed copies of which, bearing the date of September 30, 1908, were distributed among the members of the Tuberculosis Congress, I have selected as my subject for today.

Dr. Koch begins his paper by making a distinction between the theoretical and practical significance of the identity of human and bovine tuberculosis; he accords to Dr. Theobald Smith, of our Country, the credit of having first called attention to certain differences between the tubercle bacilli found in man and those found in cattle, and he acknowledges that it was Smith's work that prompted him, in co-operation with Schütz, to undertake the experiments on which his communication to the British Congress on Tuberculosis in 1901 was based. He goes on to say that human and bovine tubercle bacilli are not alike; he admits that bovine bacilli may infect human beings, but asserts that serious disease from them rarely occurs, and draws the conclusion that preventive measures against tuberculosis should primarily be directed against the propagation of human tubercle bacilli. He follows this by laying down rigid conditions that must be observed by those who seek to throw light on the relation between human and bovine tuberculosis, and by general criticisms of the investigations, most of which he characterizes as unreliable, that have been made to disprove his contention. The work of the British Royal Commission, on Human and Animal Tuberculosis, is especially criticized and the experiments

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of the Kaiserliche Gesundheitsamt in Berlin, Germany, are spoken of as "the only ones which fulfill in every way the experimental requirements."

About this part of the paper I have nothing more to say. It is followed by a further discussion of what has been done to refute Dr. Koch by those of whom he speaks as "his opponents," and as this impresses me as being the vital nucleus of the paper, I will quote verbatim.

Dr. Koch's own words are, "Others of my opponents have attempted to refute me by showing that the bacillus of the human type may be transformed into the tubercle bacillus of the bovine type and vice versa, by passages through animals, or by cultivation under artificial conditions. In this connection I can merely repeat that I am interested only in the practical significance of the difference between the two types of tubercle bacilli. For our purposes, that is, for combating tuberculosis, it is absolutely without significance what changes tubercle bacilli will undergo after being passed through a series of animals or during cultivation under some artificial conditions. Those men who consume milk and butter do not hold back and make cultural or animal experiments; they eat them in the fresh, unchanged condition. In my opinion, therefore, we are concerned here with the properties of the fresh and unchanged tubercle bacillus only. I do not deny that cultural transformations may be made with these as well as with other bacteria, but this is a question of purely theoretical value. I shall, therefore, lay it aside."

Following this paragraph, the paper deals with the results obtained from some of the more recent investigations regarding types of tubercle bacilli. The existence of the unstable type of tubercle bacilli differentiated by the British Royal Commission is discredited; the statement is emphasized that it is not of the slightest importance whether, after animal inoculation or breeding experiments, the tubercle bacillus is stable or unstable, and it is asserted that the human type of tubercle bacilli has never been found in cattle, and that the bovine type has never been demonstrated in a case of human, pulmonary tuberculosis, etc.

If we subject the passage quoted verbatim from the paper to a simple analysis, we find first, that Dr. Koch admits that

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tubercle bacilli, as various investigators who have given the matter special attention have recorded, may be transformed from one type into another, under some conditions, and, second, that he places himself on record as characterizing this fact, which he cannot refute, and which does not harmonize with his expressed views, as a "Question of purely theoretical value," notwithstanding that it is a certainly remarkably significant part of our knowledge regarding the causative agent of the commonest and most important disease of human beings, and lower animals, and clearly seems to be the very pivot on which the logical affirmation or refutation of the identity of human and bovine tuberculosis is poised.

Dr. Koch's assertion that "it is absolutely without significance what changes tubercle bacilli will undergo after being passed through animals," etc., because, "those who consume milk and butter do not hold back to make cultural or animal experiments," etc., must impress those who think about it as having the character of a quibble that is almost too trivial to be used by an investigator of his magnitude, and this quibble, I am convinced, would have received immediate and severe criticism had it come from a man whom the world owes less honor and gratitude than it certainly owes Dr. Koch, because of his many well known and far-reaching discoveries, and the measure in which his work has enabled a reduction in the aggregate of human suffering.

It is quite true, persons who eat food infected with tubercle bacilli do not stop to change the type; they eat the infected food without the least consciousness that it is infected and they would not eat it at all if they knew that it contained fresh tubercle bacilli or disease germs of any kind. Now, if tubercle bacilli are mutating organisms, and can be transformed from one type into another, as Dr. Koch grudgingly admits, we have a fairly satisfactory reason for assuming that the residence of bacilli of the so-called bovine type in the human body, will, in time, cause their transformation into bacilli of the so-called human type. It naturally follows, that those who eat food infected with tubercle bacilli of the bovine type, need not stop to make cultural or inoculation experiments with the bacilli before swal-

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lowing them, in order to have bacilli of the human type associated with the possibly resulting tuberculous lesions.

When we examine tubercle bacilli from a case of tuberculosis, the act is, in the plainest language, an examination of tubercle bacilli that have lived within and that have passed through an animal body. If we attempt to use the type of the tubercle bacilli found in our examination, as the basis for determining the source from which the case of tuberculosis was infected, the fact that tubercle bacilli can be made to change their type by passing through animal bodies, has a very practical bearing on the conclusion we are entitled to draw. In other words, when we admit that changes may occur under some conditions, it is absurd to insist that the changes did not occur under those conditions.

Facts constitute the fundamental material of rational thought, and the truest test for the validity of a conclusion is its compatibility with all the known facts.

When an organism can be made to assume two or more morphologic types, either by varying its habitat or by subjecting it to different kinds of artificial treatment, it is reasonable to conclude that it is truly polymorphic. If we find that one of the morphologic types of the organism is located with few exceptions, in one habitat, and that another morphologic type is commonly found in another habitat, the rational conclusion is that the immediate morphologic type of the polymorph is intimately correlated with its environment. Hence, if Dr. Koch is right when he admits that tubercle bacilli can be made to change their types by methods of cultivation, and by passages through animals, he must be wrong when he characterizes the tendency of tubercle bacilli to undergo morphologic variations as "a question of purely theoretical value," and, consequently, we cannot afford to follow his lead when he says, relative to the significance of the variability of tubercle bacilli, "I shall, therefore, lay it aside."

The investigations that have actually been made and that have actually demonstrated that tubercle bacilli can be morphologically modified by some methods of artificial cultivation, prove one of three things; one, that the tubercle bacillus is a

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true polymorph, the immediate type of which adapts itself more or less quickly to its environment; or, two, that the bacillus is a mutating organism of which certain mutations or naturally occurring variations are selected, and preserved by incidents in its environment; or, three, that the morphology of the bacillus is so unstable that it can be directly influenced by its environment. These investigations alone should cause some hesitation among those who seek to make a sharp distinction between the sources, human and bovine, from which infection for individual cases of tuberculosis was derived, by determining whether the lesions of the disease are associated with tubercle bacilli of one type or another type.

Add to this the investigations that have been made to show that the transformations observed under artificial conditions of cultivation are also brought about by passing strains of tubercle bacilli through animal bodies, that is, by copying in an experimental way as nearly as possible what actually occurs in nature when persons and lower animals are affected with tuberculosis, and we can no longer claim that it is reasonable to attribute a case of tuberculosis specifically to infection from a human or from a bovine source, simply because the lesions we find are associated with tubercle bacilli of the so-called human or the so-called bovine type.

Those persons who swallow infected milk, butter and other dairy products, must therefore bear in mind, no matter what types of tubercle bacilli are commonest in human tuberculosis lesions, that bovine bacilli may be very dangerous and that their less frequent occurrence in human lesions may be due to the favorable environment the human body offers for their transformation into human types. Tubercle bacilli have ample time during their residence in the bodies in which they cause disease, to undergo extensive transformations, because, as a general rule, tuberculosis is an insidious, chronic disease that progresses very slowly from infection to a determinable manifestation of its existence.

In our attempt to place a valuation on the various sources from which tubercle bacilli may reach us, we must not fail to take into consideration the unique place tuberculosis holds among

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infectious diseases. It is one of the relatively small number of infectious diseases that are common to more than one species of animals, and it is the only known infectious disease to which practically no vertebrate species is wholly immune. It has received more attention from investigators in the realms of both human and veterinary pathology, bacteriology and hygiene than any other disease, and yet our knowledge regarding it has remained, in many respects, exceedingly rudimentary. We know so little, for example, about its period of incubation, or the time that elapses between the entrance of tubercle bacilli into the body and the actual occurrence of disease, that we cannot say who is right, those investigators who believe that tuberculosis arises from infection due to exposure to tubercle bacilli at any time of life, or those who believe that the disease almost constantly develops from latent tubercle bacilli that were taken into the body during the milk-drinking period.

We know that the immediate descendants of tuberculous parents succumb to tuberculosis, not necessarily during childhood, more commonly than the descendants of healthy parents, and we know that tuberculosis is not nearly so common among persons who have been exceptionally exposed to infection during adult life, as we should naturally expect it to be. Men with tuberculous wives and women with tuberculous husbands, when their family records are clean, relative to tuberculosis, contract the disease so rarely that their exceptional exposure cannot with certainty be said to infect them more frequently than persons in general become infected. (a)

We do know that tubercle bacilli are peculiar in that they may remain alive and virulent long periods of time in circumscribed tuberculous lesions, without spreading from them

(a) Relative to the infrequency with which tuberculosis is contracted from marital or connubial exposure, the figures of Bannister, *Jour. Amer. Med. Asso.*, April 13, 1901, and those of Thom, *Zeitschrift f. Tuberkulose*, etc., Vol. VII., 1905, are instructive, and relative to the infrequency with which tuberculosis is contracted in general by healthy adults through unusually severe exposure, the evidence presented by Saugman, *Zeitschrift, Tuberk.*, etc., Vol. 10 No. 3; H. Edwin Lewis, *N.Y. Med. Record*, Aug. 9, 1902; Duncan Turner, *Inter. Med. Jour.*, June 20, 1902; Joseph Kucher, *N. Y. Med. Record*; Sept. 28, 1901; Edgar M. Crookshank, *Lancet*, Nov. 2, 1901; Lancereaux, *Bul. de l. Acad. de Med.*, April 2, 1901; F. T. Roberts, *Lancet*, March 29, 1902; and a host of other observers, is interesting.

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and without causing a general or even a visibly progressive tuberculosis, and we have some reasons to believe that latent tubercle bacilli may remain alive and virulent in the body indefinite periods of time without causing pathological conditions that can be identified as tuberculosis. And, finally, we know that obvious or perceptible tuberculosis during early child life is an extremely serious disease and most apt to have a fatal termination.

From all this we may conclude that, whatever chances we ourselves, as adults, may be willing to take in the form of exposure to tubercle bacilli in milk and dairy products, we should not be derelict with regard to the exposure of children. It is for the sake of children especially, the little beings whose welfare is a sacred obligation that can be put aside for nothing else, that the fight for pure milk should be made so strong that it will overwhelm every opposition and speedily mature in a great, life-saving victory.

I now wish to call your attention to two charts that illustrate the uncertain, varying morphology of tubercle bacilli. One of the charts illustrates that tubercle bacilli of one morphologic type may be transformed into tubercle bacilli of another morphologic type, and the other chart illustrates that either of the two morphologic types, human or bovine, may be associated with the tuberculous lesions of a considerable variety of specifically different animals.

The Relative Importance of Human and Bovine Types of Tubercle Bacilli in Tuberculosis in Man.

Dr. Wm. H. Park, New York.

The previous speaker, Dr. Schroeder, has assumed that bacilli of the bovine and human types are interchangeable. If this be true, most of the work, which we are doing, is incomplete, and I must, therefore, begin by giving my reasons for thinking that these types are not readily interchangeable.

Bacteriologists, as a rule, have found that distinct strains of bacteria are very permanent. When they are grown on artificial media, they may change in their morphology, and in other ways,

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but the real type characteristics can still be detected, even after years. Not only can the different strains still be separated, one from the other, but when returned to their original environment, they return each to its original state. When we consider tubercle bacilli obtained from human and bovine sources we find, in the first place, that all strains of bacilli from bovine sources have, in general, the characteristics of growing at first feebly on artificial media, and of killing rabbits with generalized tuberculosis when injected in one milligram doses. On the other hand, we find that the bacilli obtained from adult human sources all agree in growing more luxuriantly than the bovine type on artificial culture media, and of being less virulent in rabbits. It is true that some bovine cultures grow more vigorously than others, but none equal the human type, and some human type cultures are more virulent than others, but no cultures of the human type are as virulent for rabbits as those of the bovine type. When we obtained cultures from human infants, we found two distinct types, one similar to the Bovine type and one to the human type. This is true even during the first months of infancy.

It seems to me that whatever we may believe as to the possibility of the change in the bovine to the human type, when it continues in the human body for many years, there can be no difference in our opinions as to the fact that in early infancy the type which we obtain is the original type causing infection. We find again that in lymph glands in which there is a definite history of from two to two and one half years, that the bacilli here again are in two distinct types. Now the fact that perfectly characteristic bovine bacilli are obtained from human lymph glands, two to three years after infection shows at least that many of these do not change their type in that time.

Experimental work in animals has, it is true, demonstrated that the human type of bacilli may become slightly more virulent for rabbits or for calves, by passage through a series of animals. Such experiments have never demonstrated the change of the human into the bovine type, unless we allow undue weight to certain exceptional results, such as the English Commission obtained. They found that several calves which had been in-

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jected with a culture of the human type, yielded later cultures of the distinctly bovine type, these very same cultures, however, in other calves, did not change. I believe it to be an impossibility that the same culture really changed in one series of calves and not in another. It is immensely more probable that the calves from which the bovine bacilli were afterwards obtained, had in them bovine infection at the time of inoculation. Such an instance I found in one of our own calves, which because of a very slight rise after the tuberculin test, was killed, and a small gland filled with bovine bacilli was found. The above considerations I think, are sufficient to show that when we find bovine bacilli in man we can be certain that they always were of the bovine type, and when we find human bacilli in man we can be certain that there has been no rapid change. We must, I think, agree that the experiments of evidence of the change of the bovine into the strictly human type, is practically lacking.

During the past year and a half, a number of investigators in the Research Laboratory have been working upon this question. During this time we have taken every case of tuberculosis from the Babies' Hospital. Every case of glandular tuberculosis from St. Mary's Hospital. Every case of general tuberculosis that we could get from the Foundling Hospital, and a few cases of glandular tuberculosis taken without selection from the General Memorial Hospital.

The material from these cases was first injected into guinea pigs. The guinea pigs have been autopsied, and the cultures made upon egg and glycerin egg media. These cultures have been observed and weighed amounts have been injected into rabbits; the rabbits receiving 1 milligram and 1-100 milligram. Twenty of the cultures have been injected into calves. It is not my object in this short paper to go into details, but simply to state that, with very few exceptions, we have found two distinct types of bacilli, one similar to those obtained from human pulmonary tuberculosis; the other similar to those obtained from a considerable number of cattle, which have been used as controls.

The cultures from 70 children under five years have been examined; twenty of these had general tuberculosis. Of these

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the human type was obtained from fourteen, and the bovine from six. Ten suffered from fatal meningitis, and probably general tuberculosis. All ten of these gave the human type of bacilli. One suffered from abdominal tuberculosis, of a fatal character; this was due to the bovine bacilli. Four suffered from pulmonary tuberculosis. These were all due to the human type of bacilli. In all, then, of the thirty-five cases, twenty-eight gave human type and seven of the bovine type, that is, about 20% of the cases of fatal tuberculosis were due to the bovine type of infection, which probably was derived from milk.

In the case of abdominal tuberculosis, we were able to obtain the milk from the farm, which supplied the child, and both samples produced fatal tuberculosis in guinea pigs.

Besides these thirty-five cases, we had thirty-five of surgical operative cases. Of these twenty-nine were lymph nodes. Twenty of these were due to the human type, and nine to the bovine type. Five were not joints, and these were due to the human type. One was a localized abdominal tuberculosis, and this was due to the bovine type. We have had, therefore, thirty-five cases of surgical tuberculosis, of which twenty-five were due to the human type, and ten to the bovine type. About 28½%, therefore, were due to milk infection through bovine bacilli.

A rough calculation has brought me to believe that about 1.6% of all fatal tuberculosis in New York City is due to bovine infection through milk.

Besides the children, we have examined two hundred cases of tuberculosis in adults, and in all of these the human type has been detected. It would seem, therefore, that the danger of milk infection is largely confined to children.

Discussion.—Dr. Herzog, Chicago. It seems to me the standpoint that Koch has taken is that the danger of spreading tuberculosis from cattle to human beings, has been enormously overestimated, and it seems to me that this view is correct. It appears to me likewise that the type of the bacilli doesn't cut such a great figure, whether originating in cattle or not. We know that diphtheria bacilli vary much in type, but they all

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cause the identical disease, and can be controlled by the identical antitoxin. On the other hand, colon bacilli do not differ much, yet they may or may not cause disease.

There has appeared recently, some work from the laboratory of Dr. Park, which interested me very much. Dr. Hess, one of his assistants, reported that he found tubercle bacilli in about 16% of specimens of milk collected from small milk dealers, who fed their own children on raw milk. After Dr. Hess had found live tubercle bacilli in 16 specimens of raw milk, he went back to the families of the dealers and examined the children who had been fed on this milk, and subjected them to the von Pirquet test. None reacted, except one child, and this appeared poorly nourished. Here are sixteen cases in which children had been fed for a long time on milk containing live bovine tubercle bacilli, yet in only one case was tuberculosis present, and it was not shown that this was due to bacilli of the bovine type. These observations demonstrate the tendency on the part of many to overestimate the danger of conveying the disease through milk containing bovine tubercle bacilli. I have heard it stated that human tuberculosis only exists where there are tuberculous cattle. No statement could be more inaccurate. Kitisato has shown that human tuberculosis is very prevalent in Japan, where they have no cattle at all, as they don't use milk or cheese or meat, most of the people being vegetarians. The same thing is true of the Philippine Islands. In a large number of post-mortems made by myself, I found very few cases free from tuberculous lesions, and yet the Philipinos have no milch cows, and they do not use milk or other dairy products. So I think Koch is right when he claims that it has never been proved that there is much danger for man contracting tuberculosis from cattle.

Does Dr. Schroeder know a single instance where it has been shown that tuberculosis has been spread by the use of butter or cheese.?

Discussion.—Dr. Schoeder: My criticism of Dr. Koch's paper is based directly on his own admission that the type of a tubercle bacillus may undergo transformations and his characterization of this admitted fact as having only theoretical importance,

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notwithstanding that he uses the immediate type of a tubercle bacillus found in a tuberculous lesion for the very practical purpose of determining the source from which the infecting bacillus originated.

When it comes to a matter of different results among investigators who have attempted to change the morphology of tubercle bacilli, we must remember that our knowledge of tuberculosis is still quite rudimentary and that it is easily possible that those investigators who have recorded transformations have, it may be subconsciously, approached in some slight detail just a little closer to the natural conditions that bring about transformations than the investigators who record that no marked transformations of type occurred in their experiments. Positive evidence has a much greater value and it is more difficult to refute than negative evidence and must therefore receive first consideration.

Then calling attention to charts illustrating the dissimilar, heterogeneous morphology of tubercle bacilli from a variety of similar sources and the transformation of bacilli of the bovine type into bacilli of the human type by growth on solidified human blood serum and the transformation of bacilli of the human type into bacilli of the bovine type by passage through the bodies of cattle and sheep, he said, these are not fancies or theories, but facts.

In answer to Dr. Herzog's question he said, that it is as a rule difficult to trace any case of tuberculosis to the exact source from which the infecting organisms were derived, but that it is known that milk often contains virulent tubercle bacilli, that the cream from such milk will contain tubercle bacilli in greater concentration and that, when the bacilli are present in cream, they are transferred to the butter made from it.

If tubercle bacilli can undergo the transformations of type recorded by a number of investigators those from the bovine source may be of much greater importance for public health than the figures presented by Dr. Park show them to be.

Discussion.—Dr. Bracken, Minneapolis, said that the Association was indebted to Dr. Park for the conservative position taken

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by him in dealing with his subject. None of us want to use milk from tuberculous cows, neither do we want to use milk from cows sick from any disease. It often seems that veterinarians make too much of the possibility of the change from the bovine to the human type of tuberculosis. On the other hand, medical men are becoming rather conservative on this point. It would seem as if the veterinarians felt that if it was proven, that the danger of infection of the human from the bovine was slight, it would be difficult to enforce the tuberculin testing of dairy herds. He said he would not wish to see the tuberculin testing of herds abolished, but he was tired of hearing the argument presented, time after time, before legislatures that there was great danger of transmission of tuberculosis from the cow to the human by milk, and thus securing large appropriations to pay for cattle killed on account of a reaction to the tuberculin test. Dr. Park has shown that less than 2% of the cases of tuberculosis in New York City could be considered of the bovine type in origin. In the country at large probably one per cent. would more than represent the human cases of tuberculosis of bovine origin. Dr. Bracken stated that in Minnesota the legislature has appropriated thousands of dollars nominally to protect this one per cent against infection, while little had been done by the same legislatures to provide for the other ninety-nine per cent. of human tuberculous cases.

We all want to see tuberculosis wiped out, but we would like to see some of the money spent directly for tuberculous human beings rather than paying for the tuberculin reacting cattle killed.

Discussion—Dr. H. L. K. Shaw, Albany, thought that Dr. Park's paper was most convincing. The work done by Dr. Theobald Smith, the British Commission and the German Commission, all came to the same conclusion in regard to the differences between the two types of bacilli. Dr. Park's account of the very excellent work being done in New York is worthy of a great deal of consideration. The last speaker had brought up the very practical point in regard to the danger of belittling the importance of the spread of human tuberculosis from human sources.

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In regard to certified milk there is no question that we want to have the cows free from tuberculosis and get milk guaranteed to be absolutely free from tuberculosis. Dr. Koch said at the Conference in Washington that he would in the next two years interest himself in a very definite manner to throw light on the question of the transmissibility of bovine tuberculosis. He called upon us all to aid in this investigation. I think we should co-operate in an unbiased and temperate manner.

I believe sometimes the cow is convicted on circumstantial evidence. In our hospital we have had only pulmonary and mediary types of tuberculosis and in every one have demonstrated the human bacilli. I feel that the danger from the bovine bacillus is exaggerated. The people read in the daily papers that it is a crime to feed babies raw milk and the public gets a false sense of security when cows have been tuberculin tested and neglect the essential things for preventing tuberculosis. Human contagion is the chief source of infection.

Discussion.—Dr. C. J. Hastings, of Toronto, said that it was, apparently, not possible as yet, to guarantee the absence of tubercle bacilli even in certified milk. Referring to the matter of transmissibility of bovine tuberculosis, it was not easy to get over the finding of the British Royal Commission considering the accuracy of their technique. Dr. McCaw, Senior Physician to the Belfast Hospital for Sick Children, after twenty years of careful study of tuberculosis in children in connection with the seven leading hospitals for children in England, Ireland and Scotland, reports that from 25 to 30% of all the children treated in these hospitals were suffering from some form of tuberculosis.

In regard to the statement as to the observations made by Dr. Hess in reference to the preponderance of bacilli in the cream and the small percent of the children using the milk containing tubercle bacilli, contracting the disease, in my opinion the time was too short in which to make conclusive observations. In how many of these cases tubercle bacilli may have gained entrance to the system and there lying latent only to manifest themselves in years to come, no one can tell. In many of the so-called cases of hereditary tuberculosis there is no manifestation of the

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disease until adolescence. Is it not more than probable that the germs have been taken in in early childhood through the alimentary canal either by kissing or using of the same eating utensils?

As to the absence of intestinal tuberculosis in children fed on raw milk, intestinal tuberculosis is rare in children compared with other forms. The mucous membrane of the bowels in children offer little or no resistance to the penetration to the bacilli which thereby gain access to the lymph and blood stream through which they are doubtless conveyed to different parts of the body where they may remain latent for years.

Discussion.—Dr. R. G. Freeman, New York, said that Dr. Park is doing the work that we have needed for a long time. It is the first time that a large number of cases have been carried through in this way, and it seems to him that Dr. Park has already a sufficient series for us to accept his conclusions, which are really that the bovine type of tuberculosis is a very rare cause of tuberculosis in man, and that it is a frequent cause in infancy. And, that there is every reason for us to be just as careful as we have been about tuberculosis in cattle, particularly those that are used to produce milk for infant feeding.

Discussion.—Dr. Henry L. Coit, Newark, said that as to the prevalence of tuberculosis among dairy cattle, he would relate a recent experience that their dairyman has had in securing cattle immune to the tuberculin test. It had been their custom to send their veterinarian with him for the purchase of these cattle. The rule was that no cattle that have not been found free from tuberculosis should come upon the premises. They do not test them upon the premises. They found recently that it was impossible to find such cows without going up near the Canadian border to get them.

While in Belgium, two years ago, he had found that they have a very strict law against the entrance of tuberculous cattle. The result is that all cattle coming from Holland, (which is the source of their cow supply) were held in quarantine on the border. He was asked to see these cows, of which there were 200 await-

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ing the test. He asked what percentage would be sent back and was told from 40 to 50%. He did not consider bovine tuberculosis a negligible matter. He was not ready to follow the dictum which seemed to make danger of transmission of tuberculosis from cow to man a negligible quantity. He thought it a matter to be most carefully considered, and of grave importance.

Discussion.—Dr. Herzog, Chicago: I do not say it is a negligible quantity; quite the contrary. It is a matter to be taken into consideration. The point I make is simply that we have overestimated the danger. I am quite in favor of testing the cattle and wiping out tuberculosis from among them.

Dr. Schroeder: I have always guarded my statements by saying that I am myself convinced that the human source is the most important source of tuberculosis, but if 1.7% is attributable to bovine tuberculosis, it is not a negligible quantity.

Dr. Park, New York: I think, as Dr. Schroeder says, that 1.7% is not a negligible quantity. It would mean in New York 300 deaths each year. It is a considerable quantity, yet I can see from Dr. Bracken's standpoint that if the other 98% do not get fair treatment it is a great mistake, but caring for the 2% is not going to do any harm.

Municipal Regulation of the Production and Sale of Market Milk.

Thomas Darlington, M. D. Commissioner of Health of the City of New York.

Dr. Darlington said: "That at the beginning of the campaign for pure milk in New York City, which has developed into the complete and systematic inspection of the entire supply of that City, the first steps included the inspection of all cow barns located within or near the City limits. In the Borough of Brooklyn, a number of extremely filthy stables were found. In one

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week alone, 17 of these dairies were closed, and the maintenance of such dairies prohibited. The country end was then taken up. The system in vogue in New York, is that of Receiving Stations located in the country, there being over 1000 of these with an average list of patrons numbering about 40. The first step was the systematic inspection and improvement of the creameries, or milk shipping stations, themselves. It is hard to describe the filthy methods found, and the extremely unsanitary conditions that had been allowed to exist without any provision or inspection from authorities interested in the sanitation and hygiene of such places. Some of these creameries, when first inspected, scored as low as 23% on a perfect score of 100%, and very few scored higher than 80%. Now none are allowed to ship to New York that score under 60%, and a large number of the plants have been so improved as to score 95% to 96%. It is now necessary for all dealers to have their creameries or milk receiving stations in perfect condition before a permit is granted for them to sell milk in the City of New York. When the inspection of dairy farms commenced, it was a question of trying to lead these people along and teach them something, but it is hard work to teach people who toil all day and never see a newspaper except on Sunday, and who know nothing whatever about such matters as germs, but when you teach them that when they don't wash up and obey the Board of Health requirements, their milk cannot be received in the city, they begin to understand. At first there was opposition among the farmers to the right of the Department of Health of the City of New York to enter their premises. This feeling has entirely disappeared, and in the work antagonism and obstruction is no longer met with, but instead, a significant spirit of interest and co-operation. Few, if any, contracts are now made between dealers and farmers for milk, without a stipulation that all milk and dairy farms come up to the requirements of the New York City Department of Health."

The American Association of Medical Milk Commissions

Milk Commissions in the United States and Canada.

* Indicates membership in A. A. M. M. C.

A. B. C. Representation of Commission at 1st, 2nd, 3rd Sessions respectively.

a. b. c. Attendance upon 1st, 2nd, 3rd Sessions respectively.

***Milk Committee of the Medical Society of the County of Albany, N. Y. Organized, 1902. A. C.**

James P. Boyd, M. D., President 152 Washington Avenue.
Henry L. K. Shaw, Secretary *a. c.* 198 Washington Avenue.

***Milk Commission of the Summit Co., Med. Society, Akron, Ohio., Organized, 1908. A.**

F. A. SIPPY, M. D., President 21 Arch Street.
E. M. WEAVER, M. D., Secretary *a.* 500 Everett Building.
E. J. CANFIELD, Treasurer Dobson Building.
J. H. WEBER, M. D. Dobson Building.
E. A. WEEKS, 511 Everett Building.
D. S. BOWMAN, M. D. 339 Crosby Street.
M. L. HUNT. 95 E. Market Street.

***Milk Commission of the Broome Co., Med. Society, Binghamton, N. Y. Organized, 1908.**

DR. LEROY D. FARNHAM, President 42 Main Street.
W. S. OVERTON, M. D., Secretary Hawley Street.
P. H. SHAW, M. D., Main Street
GEO. H. JENKINS Main Street.

***Milk Commission of the Suffolk District Med. Society, Boston, Mass. A. C.**

JOHN LOVETT MORSE, M. D., Chairman 70 Bay State Road.
FRITZ B. TALBOT, M. D., Secretary and Treasurer 171 Bay State Road.
DR. EDWIN A. LOCKE, 117 Beacon Street.
DR. JAMES MARSH JACKSON 230 Beacon Street.
DR. FRANCIS H. SLACK *a. c.* 739 Bolyston Street.

***The Certified Milk Commission of the Bridgeport Med. Assoc. Bridgeport, Conn. Organized, May, 1908.**

DR. F. L. DAY 475 State Street.
DR. CHARLES NAHUM HASKELL, Secretary 467 State Street.
DR. S. M. GARLICK 474 State Street.
DR. C. C. GODFREY 340 State Street.
DR. J. W. WRIGHT 810 Myrtle Avenue.
DR. GEO. B. COWELL 502 Washington Avenue.
DR. N. B. COGSWELL Stratford, Conn.
DR. C. L. BANKS 307 West Avenue.
DR. W. H. DONALDSON Fairfield, Conn.
DR. E. A. McLELLAN 105 Park Avenue.

***Milk Commission of the Med. Soc. of the Co. of Kings, Brooklyn, N. Y. A. B. C.**

DR. WM. P. NORTHRIDGE, Chairman *b.* 21 Hanson Place.
DR. WALTER D. LUDLUM, Secretary and Treasurer 362 Marlboro Road.
HARRIS MOAK, M. D., Bact. and Chem. *a. c.* 360 Park Place.
ELIZA MOSHER, M. D. *a. c.* ALFRED BELL, M. D.
DAVID MYERLE, M. D. GEO. F. LITTLE, M. D.
LOUIS C. AGER, M. D. V. A. ROBERTSON, M. D.

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***Milk Commission of the Silver Bow Co., Med. Society, Butte, Montana,
Organized, Nov. 1908.**

DR. I. D. FREUND, President.....Phoenix Block.
C. T. PRIGOT, Secretary.....Penna. Block.
DR. DONALD CAMPBELL.....DR. H. J. McDONALD.
DR. M. J. SCOTT.

***Milk Commission of the Canadian Medical Association, Toronto, Canada. C.
DR. CHAS. J. HASTINGS, Chairman c.....258 Wellesley Street.**

***Milk Commission of the Cambridge Med. Improvement Society, Cambridge,
Mass., Organized, May, 1906. A.**

DR. WILLIAM D. SWAN, President.....167 Brattle Street.
DR. ALBERT P. NORRIS, Secretary.....760 Massachusetts Avenue.
DR. FREDERICK TAYLOR.....1735 Massachusetts Avenue.
DR. JOHN F. FAIR.....390 Cambridge Street.

***Milk Commission of the Children's Hospital Society, Chicago, Ill. A. B.**

DR. ISAAC A. ABT a. b.....100 State Street.
MR. JOHN MCCAULIFF a.....255 W. Adams Street.
DR. JOHN COOK.....5708 Rosalie Court.

***Milk Commission of the Chicago Medical Society, Chicago, Ill.
Organized January, 1909. C.**

DR. ISAAC A. ABT, President.....4326 Vincennes Avenue.
DR. CHAS. S. BACON c.....756 Sedgewick Street.
DR. SAMUEL J. WALKER.....160 Lincoln Park Boulevard.
DR. J. W. ANDERSLICE.....Oak Park, Ill.
DR. F. S. CHURCHILL.....439 N. State Street.
DR. M. P. HATFIELD.....3346 So. Park Avenue.
DR. A. C. COTTON, Ex. Officio.....1485 Jackson Boulevard.

***The Milk Commission of the Academy of Medicine, Cincinnati, Ohio.
Organized, June, 1906. A. B. C.**

DR. ALFRED FRIEDLANDER, Chairman b.....4 W. Seventh Street.
DR. OTTO P. GEIER, Secretary a. b.....124 Garfield Place.
HENRY L. WOODWARD, Treasurer b. c.....The Alexandria.
MR. ERNST DUBRUL.....507 E. Pearl Street.

***Milk Commission of the City of Cleveland, Ohio., Organized, Dec. 1904. A. B. C.**

SAMUEL MATHER, ESQ., President.....1265 Euclid Avenue.
DR. J. J. THOMAS, Secretary b. c.....1110 Euclid Avenue.
DR. ARNOLD F. FURRER, Ass't Secretary b. c.....1110 Euclid Avenue.
DR. EDWARD F. CUSHING, M. D.....4712 Euclid Avenue.
DR. H. H. POWELL.....1861 Prospect Avenue.
DR. S. W. KELLY.....2255 E. 55th Street.
DR. H. D. BISHOP.....762 Rose Building.
DR. E. O. ADAMS.....11307 Ressler Road.

The American Association of Medical Milk Commissions

***The Milk Commission of the El Paso Co., Medical Society, Colorado Springs, Colorado. C.**

DRS. C. F. GARDINER.	F. L. DENNIS.
W. H. SWAN.	G. B. WEBB.
H. W. HOAGLAND c.	H. C. WATT.
L. H. MCKINNIE.	Z. H. MCCALAHAN.
W. F. MARTIN.	P. O. HANFORD.
C. F. STOUGH.	A. C. MAGRUDER.

***Milk Commission of the Academy of Medicine, Columbus, Ohio, Organized, June, 1908. C.**

DR. ERNST SCOTT, President	Clintonville, Ohio.
DR. GEO. C. SCHAEFFER, Secretary c	112 E. Broad Street.
MR. GEO. W. LATTIMER, Treasurer	Kaufman-Latler Co.
DR. DICKSON L. MOORE	E. State Street.
DR. O. H. SELLENINGS	E. Oak Street.
DR. FRANK RAREY	E. Main Street.
DR. DAVID S. WHITE (Vet.)	N. Neil Avenue.
PROF. OSCAR ERF	Ohio State University.
MISS JENNIE L. TUTTLE (Nurse)	78 E. Rich Street.

***Milk Commission of the Montgomery, Co., Med. Society, Dayton, Ohio, Organized, June, 1907. B. C.**

DR. C. W. KING, President	223 N. Main Street.
DR. A. L. LIGHT, Secretary b	1000 U. B. Building.
DR. J. S. CONKLIN, Treasurer	21 E. First Street.
DR. A. H. LANE	1835 W. Third Street.
DR. GEO. GOODHUE c	131 N. Perry Street.
DR. E. M. HUSTON	28 N. Wilkinson Street.

***The Milk Commission of the Wayne Co., Medical Society, Detroit, Mich., Organized, April, 1907. B. C.**

DR. R. S. ROWLAND, Chairman b. c	512 Washington Arcade.
DR. T. B. COOLEY, Secretary	Fine Arts Building.
DR. NATHAN JENKS	Grand Circus Building.
DR. CHAS. DOUGLAS	959 Jefferson Building.
DR. C. G. JENNINGS	435 Jefferson Avenue.
DR. GUY L. KIEFER, Health Officer.	
DR. E. H. HAYWARD, Board of Health.	
DR. HERBERT M. RICH	435 Jefferson Avenue.
DR. W. J. WATSON, Jr.	216 Theodore Street.

***Milk Commission of the Elmira Acad. of Med., Elmira, N. Y. A. B.**

DR. C. W. M. BROWN, President a	110 W. Church Street.
DR. ROSS G. LOOP, Secretary a	54 So. Main Street.
DR. A. W. BOOTH	150 Main Street.
DR. SHERMAN VOORHEES b	414 Main Street.
DR. H. D. WEY	369 Main Street.
DR. T. A. WALES	503 Williams Street.

***Union Co. Med. Society, Milk Commission, Elizabeth, N. J. C.**

DR. WM. H. MURRAY, President	Plainfield, N. J.
DR. STEPHEN T. QUINN	Elizabeth, N. J.
DR. E. B. GRIER	Elizabeth, N. J.
DR. JOS. B. HARRISON	Westfield, N. J.
DR. ARTHUR STERN, Secretary c	224 E. Jersey St., Elizabeth, N. J.

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The Milk Commission of Galesburg, Ill., Organized, 1908. *B. C.

DR. BENJ. D. BAIRD, Chairman *b. c.*..... Main Street.
DR. E. N. NASH, Secretary.
DR. G. A. LONGBRAKE *b.*
DR. J. H. BRYANT.

***Milk Commission of the Kent Co., Med. Society, Grand Rapids, Mich. *B.* Organized, Nov. 1907.**

DR. G. MCBRIDE, Chairman.....257 E. Fulton Street.
DR. WM. H. VEENBOER, Secretary.....504 Ashton Building.
DR. J. B. WHINERY.....2. Wonderly Building.
DR. JOHN A. MCCOLL.....513 Widdicomb Building.
DR. THOS. C. IRWIN.....Majestic Building.
COLLINS H. JOHNSTON, M. D. *b.*.....84 Monroe Street, Ex. Officio.

***Medical Milk Commission of the Greenwich Med. Society, Greenwich, Conn., Organized, June 1908.**

A. W. KLEIN, M. D., Chairman, Health Officer.
EDW. PARKER, Secretary and Treasurer.....Putman Avenue.
CHAS. W. SMITH, M. D.
VIRGIL PLATTI, M. D.

Milk Commission of the Hartford Co., Med. Society, Hartford, Conn. *A.

DR. WALTER G. MURPHEY *a.*.....75 Pratt Street.
DR. ROBERT S. STARR.
DR. ALVA ABRAMS.
DR. ARTHUR J. WOLFF.
DR. CHAS. BEACH.

The Milk Commission of the Indianapolis, Med. Society, Indianapolis, Ind., Organized, Sept. 1908. *B. C.

DR. CHAS. E. FERGUSON, President *b.*.....Newton-Claypool Building.
DR. O. N. TORIAN, Secretary and Treasurer.....Willoughby Building.
DR. LOUIS BURKHARDT.
DR. C. R. LOWDER.....323 N. Delaware Street.
DR. W. D. HOSKINS.....Newton-Claypool Building.

***Milk Commission of Jackson, Michigan.**

DR. W. H. ENDERS, Secretary.....Jackson State Savings Bank Building.

***Duval County Medical Milk Commission, Jacksonville, Florida. Organized, June, 1908.**

JAMES V. FREEMAN, M. D., Chairman.....225 W. Forsyth Street.
WM. EDSON ROSS, M. D., Secretary.....43 Ashley Street.
DR. R. H. MCGINNIS.....501 Lama Street.
DR. G. R. HOLDEN.....W. Beaver Street.
DR. H. R. DREW.....Bisbee Building.
DR. HIRAM BYRD.....Dyal-Upchurch Building.
DR. C. L. JENNINGS.....305 Cedar Street.
DR. C. E. TERRY.....Fort George, Florida.

***Milk Commission of the Galva District Med. Society, Kewanee, Ill. Organized, Feb. 1909.**

DR. H. N. HEFLIN, President.

The American Association of Medical Milk Commissions

***The Ocean Co. Med. Society Milk Commission, Lakewood, N. J.**

DR. WM. G. SCHAUFFLER., Secretary.

***The Milk Commission of the Jefferson Co. Med. Society, Louisville, Ky. Organized, June, 1906. A. B.**

DR. CUTHBERT THOMPSON, President.....3rd and Broadway.
DR. BEN CARLOS FRAZIER, Secretary.....Atherton Building.
DR. HENRY ENOS TULEY *a. b.*.....111 W. Kentucky Street.
DR. JOHN A. CECIL.....Atherton Building.
DR. J. W. BLANTON.....Pleasant Ridge Park, Ky.

MDX

***The Milk Commission of the Malden Med. Society, Malden, Mass. C.**

DR. A. J. STEVENS, Chairman <i>c.</i>	539 Main Street.
DR. E. W. BARRON, Secretary.	DR. J. W. LAWRENCE.
DR. FRITZ GAY.	DR. W. C. McDONALD.
DR. W. W. KINGSBURY.	DR. C. E. PRIOR.

***The Milk Commission of the Hennepin Med. Society, Minneapolis, Minn.**

DR. J. P. SEDGWICK. DR. J. C. LITZENBURG
DR. ROBERT WILLIAMS.

***The Milk Commission of the Milwaukee Med. Society, Milwaukee, Wis. Organized, Jan. 1903. A. B.**

DR. LORENZO BOORSE, President *a. b.*.....Wells Building.
DR. A. W. MYERS, Secretary *a. b.*.....141 Wisconsin Street.
DR. J. M. BEFFEL.....3200 Clybourne Street.
DR. G. H. FELLMAN.....906 North Avenue.
DR. A. W. Gray.....141 Wisconsin Street.
DR. L. F. GERMAIN.....Majestic Building.
DR. E. W. KELLOGG.....Majestic Building.
DR. A. J. PATEK.....141 Wisconsin Street.
DR. P. F. ROGERS.....1114 State Street.

***The New York Med. Milk Commission, New York City, N. Y. Organized, 1894. C.**

DR. J. H. HUDDLESTON, Secretary.....145 W. 78th Street.
DR. L. E. HOLT.....14 W. 55th Street.
DR. R. B. KIMBALL.....15 E. 41st Street.
DR. L. E. LAFETRA.....58 W. 58th Street.
DR. W. P. NORTHRUP.....57 E. 79th Street.
DR. A. M. THOMAS.....35 W. 54th Street.
DR. D. BOVAIRD.....126 W. 58th Street.
DR. A. FLINT.....34 E. 54th Street.
DR. C. G. KERLEY.....132 W. 81st Street.
DR. M. NICOLL.....124 E. 60th Street.
DR. W. H. PARK *c.*.....315 W. 76th Street.
DR. P. VAN IGEN.....125 W. 71th Street.
DR. L. R. WILLIAMS.....839 Madison Avenue.

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***Milk Commission of the Med. Society of the Co. of N. Y., N. Y. C. Organized, 1900. A. B. C.**

DR. E. K. DUNHAM, President.....	35 E. 68th Street.
DR. R. G. FREEMAN, Secretary <i>a. b. c.</i>	211 W. 57th Street.
DR. WM. H. PARK, Treasurer <i>a. c.</i>	315 W. 76th Street.
DR. H. B. CHAPIN.....	51 W. 51st Street.
DR. A. LAMBERT <i>b.</i>	36 E. 31st Street.
DR. W. P. NORTHRUP <i>a.</i>	57 E. 79th Street.
DR. G. M. SWIFT.....	20 W. 55th Street.
DR. J. E. WINTERS.....	25 W. 37th Street.
DR. A. JACOBI.....	19 E. 47th Street.
DR. W. L. CARR.....	68 W. 51st Street.
DR. T. S. SOUTHWORTH <i>c.</i>	807 Madison Avenue.
DR. DAVID BOVAIRD, Jr.....	126 W. 58th Street.
DR. WARD B. HOAG.....	128 W. 81st Street.

***Milk Commission of the Essex Co., N. J., Newark, N. J., Organized, April, 1893. A. B. C.**

DR. H. L. COIT, Chairman <i>a. b. c.</i>	277 Mt. Prospect Avenue, Newark, N. J.
DR. FLOY McEWEN, Secretary <i>c.</i>	299 Belleville Avenue, Newark, N. J.
DR. L. E. HOLLISTER.....	138 Clinton Avenue, Newark, N. J.
DR. MEFFORD RUNYON.....	110 Irving Avenue, S. Orange, N. J.
DR. T. W. HARVEY <i>c.</i>	Main Street, Orange, N. J.
DR. H. B. WHITEHORNE.....	Verona, N. J.
DR. CHARLES F. LEHBACH.....	537 Hight Street, Newark, N. J.
DR. JAMES A. EXTON.....	75 Beach Street, Arlington, N. J.
DR. LESLIE C. LOVE.....	Montclair, N. J.
DR. J. MINOR MAGHEE.....	West Orange, N. J.
DR. WILLIAM H. WHITE.....	Bloomfield, N. J.
DR. ELMER G. WHERRY <i>a.</i>	325 Clinton Avenue, Newark, N. J.

Milk Commission of Ocala, Florida, Organized, July, 1908.

DR. E. VAN HOOD.

***Milk Commission of the Alameda Med. Society, Oakland, California., Organized, Feb. 1909.**

DR. THOS. C. McCLEAVE, President.....	220 Bancroft Way, Berkeley, Cal.
SARAH I. SHUEY, M. D., Secretary and Treasurer...	14th Street, Oakland, Cal.
DR. JAMES K. HAMILTON.....	Encinal Hall, Bay Station, Alameda, Cal.
DR. PAULINE S. NUSBAUMER.....	1169 Broadway, Oakland, Cal.
DR. CHARLES H. ROWE.....	111-13th Street, Oakland, Cal.

***Milk Commission of the Los Angeles Co. Med. Society, Pasadena, Cal. B. C.**

DR. FITCH C. E. MATTISON, President <i>b. c.</i>	Chamber of Commerce, Pasadena.
DR. GEO. H. KRESS, Secretary.....	Bradbury Building, Los Angeles.
DR. L. M. POWERS, H. O.....	City Hall, Los Angeles.
DR. STANLEY P. BLACK.....	Pasadena.
DR. TYTIAN J. COFFEY.....	Los Angeles, Cal.
DR. H. B. STEHMAN.....	Pasadena.
DR. JOS. H. McBRIDE.....	Pasadena.
DR. E. B. HOAG.....	Pasadena.
DR. W. L. ZUIEL.....	Pasadena.

*Milk Commission of the Passaic Co. Med. Society, Paterson, N. J.
Organized, Sept. 1908. C.

***Milk Commission of the Allegheney Co. Med. Society, Pittsburg, Pa.,
Organized, July, 1907. B. C.**

***Milk Commission of the Monroe Co. Med. Society, Rochester, N. Y.,
Organized, 1906. B.**

**The Franklin County Milk Commission, Saronac Lake, N. Y.,
Organized, Jan. 1909.**

***Santa Barbara Medical Milk Commission, Santa, Barbara, Cal.
Organized, Dec. 1908.**

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***St. Louis Pure Milk Commission, St. Louis, Mo., Organized, Feb. 1904. A. B. C.**

DR. ALBERT MERRELL, President *a. b. c.*

MR. W. H. McCLAIN, Secretary.....1623 Washington Avenue.

Officers of Certification Committee.

DR. GEO. M. TUTTLE, Chairman.....1726 N. 13th Street.

DR. A. S. BLEYER, Secretary *b.*.....705 N. Kingshighway.

DR. THOS. A. BUCKLAND.

MR. J. HAL LYNCH.

DR. JOHN ZAHORSKY *b.*

DR. W. W. GILBERT.

DR. J. C. FALK.

DR. BISHOP.

***Milk Commission of the San Francisco Co. Med. Society, San Francisco, Calif., Organized, Nov. 1905. B. C.**

DR. ALFRED BAKER SPAULDING, President.....Schroth Building.

DR. ADELAIDE BROWN, Secretary and Treasurer *b.*.....2520 Sacramento Street.

DR. SANFORD BLUM.....1316 Sutter Street.

DR. LEWIS SAYRE MACE.....Schroth Building.

DR. MINARA KIBBE.....1921 Page Street.

DR. GEO. S. BAKER.....Post Office Building.

MR. NATHAN M. MORAN.....Union Trust Building.

***Milk Commission of the Sanitary Department, City of Seattle, Wash., Organized Dec. 1905.**

DR. WILLIAM G. BOOTH, President.....508 Alaska Building.

DR. PHILIP VON PHIL, Secretary.....Alaska Building.

DR. R. M. STITH.

DR. GEO. B. McCULLOCH.

DR. F. F. GARDNER.

***Milk Commission of the Onondaga Med. Society, Syracuse, N. Y. Organized, August, 1905. A. C.**

DR. A. CLIFFORD MERCER, President *a. c.*.....324 Montgomery Street.

DR. A. S. HOTALING, Secretary.....801 E. Genesee Street.

DR. D. M. TOTMAN *a.*.....303 Montgomery Street.

DR. E. J. WYNKOOP.....510 James Street.

DR. J. R. JOHNSON.....18, The Kenyon

DR. ARTHUR S. RULAND.....300 Delaware Street.

DR. S. ELLIS CRANE.....Onondaga Valley, N. Y.

***Milk Commission of the Academy of Medicine, Toledo, Ohio, Organized, April, 1907.**

DR. CHAS. C. CHAPMAN, President.....1708 Madison Avenue.

DR. CHAS. W. MOOTS, Secretary and Treasurer.....The Nicholas.

DR. JOHN F. LIKEN.....Madison Court.

DR. J. H. McVAY.....325 Michigan Street.

MR. GEO. B. STORER.....Chamber of Commerce, Nasby Building.

MRS. W. HUMPHREY, President..Fed. Women's Clubs, 2235 Maplewood Ave.

***Milk Commission of the Academy of Med., Toronto, Canada., Organized, Oct. 1908. C.**

DR. HENRY MACHELL, President *c.*.....95 Bellevue Avenue.

DR. W. L. T. ADDISON, Secretary and Treasurer.....431 Broadview Avenue.

DR. J. A. AMYOT.....Lab. Prov'l Board of Health.

DR. ALLEN BAINES.....228 Bloor Street, W.

DR. ALEX. McPHERDRAN.....151 Bloor Street, W.

DR. C. J. C. O. HASTINGS *c.*.....258 Wellesley Street.

The American Association of Medical Milk Commissions

The Kansas City Pure Milk Commission. C.

DR. GEO. C. MOSHER, Chairman *c.* 605 Bryant Bldg.
DR. MAX GOLDMAN, Secretary 309 Century Bldg.

***The Wheeling Certified Milk Commission, Wheeling. W. Va., Organized, March, 1909. C.**

DR. ROBERT J. REED, President. <i>c.</i>	S. S. BLOCH, Esq.
DR. WM. HAY McCLAIN, Secretary.	C. C. SCHMIDT, Esq.
DR. ANDREW WILSON. <i>c.</i>	H. C. OGDEN, Esq.
DR. FRANK M. HUPP.	W. E. STONE, Esq.
DR. EUGENE A. HILDRETH.	E. W. OGLEBAY, Esq.
WM. G. CALDWELL, Esq.	

Milk Commission of the Luzerne Co. Med. Society, Wilkesbarre. Pa. C.

DR. CHARLES LONG, President.	DR. J. I. RAE
DR. MORRIS AHLBORN, Secretary.	DR. ALEXANDER. FELL.
DR. R. L. WOODHASM.	DR. CHAS. MINER. <i>c.</i>

***The Medical Milk Commission of Worcester, Organized, Oct. 1908.**

DR. CHARLES L. NICHOLS, President.....	38 Cedar Street.
DR. R. J. WARD, Secretary.....	397 Pleasant Street.
DR. LESTER C. MILLER.....	744 Main Street
DR. EDWIN R. LEIB.....	834 Main Street.
DR. GEO. E. EMBRY.....	262 Lincoln Street.
DR. MERRICK LINCOLN.....	2 Linden Street.
PROF. LEONARD P. KINNICULT.....	77 Elm Street.
DR. THOMAS H. GAGE, JR.....	1 William Street.

INDIVIDUAL MEMBERS OF A. A. M. M. C.

DR. BRUCE KEATOR.....	Trenton, N. J.
DR. VICTOR A. NORGAARD.....	Honolulu, Hawaii.
DR. A. CLARK HUNT <i>c.</i>	Trenton, N. J.
MR. B. H. RAWL.....	Washington, D. C.
MR. S. M. SHOEMAKER <i>c.</i>	Eccleston, Maryland.
DR. CHAS. E. NORTH <i>c.</i>	New York City.
DR. KENELM WINSLOW.....	Empire Building, Seattle, Wash.
*DR. LEONARD PEARSON <i>a. b.</i>	U. of P., Philadelphia, Pa.
DR. M. J. ROSENAU <i>a. b. c.</i>	Washington, D. C.
DR. R. M. ALLEN.....	Dep't of Justice, Washington.
PROF. W. A. STOCKING <i>a. b. c.</i>	Cornell, Ithaca, N. Y.
DR. EDWIN E. BOND.....	Caldwell, N. J.
DR. JOHN RUHRAH.....	Baltimore, Md.
DR. HENRY MITCHELL.....	Trenton, N. J.
MR. H. A. HARDING <i>a.</i>	Geneva, N. Y.
DR. J. H. MASON KNOX <i>b.</i>	Baltimore, Md
DR. D. L. VAN SLYKE <i>a.</i>	Geneva, N. Y.
*DR. CHAS. HARRINGTON <i>a.</i>	Boston, Mass.
DR. C. F. HEGNER <i>a. b.</i>	628 Elm Street, Cin'ti., O.
DR. JAMES H. BROWN.....	Montclair, N. J.
DR. M. P. RAVENEL <i>a. b.</i>	U. of Wis. Madison, Wis.
MR. C. B. LANE <i>a. c.</i>	11th and Jefferson Streets, Phil.

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INDIVIDUAL MEMBERS OF A. A. M. M. C.—Continued.

PROF. E. VOORHEES.....	New Brunswick, N. J.
COMMISSIONER R. A. PEARSON <i>a. b. c.</i>	Albany, N. Y.
DR. T. Y. SUTPHEN.....	Newark, N. J.
DR. J. S. EVANS, JR. <i>a. c.</i>	2018 Locust Street, Phil.
MR. ED. H. WEBSTER <i>b.</i>	Washington, D. C.
DR. J. H. MULES.....	Auburn, Cal.
DR. WERNER RUNGE.....	Newark, N. J.
DR. FRANK T. EISENMANN <i>b.</i>	22 E. Main Street, Louisville, Ky.
DR. W. A. EVANS <i>b. c.</i>	Chicago, Ill.
DR. HELEN MACMURCHY.....	133 Bloor Street, Toronto, Canada.
PROF. E. HASTINGS <i>b.</i>	Univ. of Wis., Madison, Wis.
DR. F. F. WESBROOK <i>b.</i>	Univ. of Minn., Minneapolis, Minn.
DR. ALDEN WILLIAMS <i>b.</i>	82 Monroe Street, Grand Rapids.
DR. H. M. BRACKEN.....	1010 4th Street, Minneapolis, Minn.
DR. J. HENRY SCHRODER.....	22 W. 7th Street, Cin'ti., O.
DR. H. A. CHRISTMANN.....	758 Derby Avenue, Cin'ti., O.
DR. WEBSTER S. SMITH <i>b. c.</i>	Dayton, O.
PROF. A. R. WARD <i>a. b.</i>	Cornell Univ., Ithaca, N. Y.

* Deceased.

ROSTER AT ATLANTIC CITY MEETING.

The following registered at the Third Annual Conference of the American Association of Medical Milk Commissions.

S. H. AYERS.....	Washington, D. C.
A. F. ALEXANDER.....	Paterson, N. J.
PHILIP KING BROWN.....	San Francisco, California.
EMIL G. BECK.....	Chicago, Ill.
CARL BECK.....	Chicago, Ill.
P. DUBOIS BUNTING.....	Elizabeth, N. J.
H. M. BRACKEN.....	Minneapolis, Minn.
CHARLES S. BACON.....	Chicago, Ill.
B. A. BARNEY.....	Hornell, N. Y.
BENJ. D. BAIRD.....	Galesburg, Ill.
WILLIAM E. BURTON.....	New York, N. Y.
H. W. CONN.....	Middletown, Conn.
HENRY L. COIT.....	Newark, N. J.
J. J. COONS.....	Columbus, O.
ALEX. CAMPBELL.....	Brooklyn, N. Y.
FANNIE W. COWLE.....	Hot Springs, Ark.
JAMES CUTTER.....	San Antonio, Texas.
MRS. C. H. COCKE.....	New York City, N. Y.
MRS. S. B. DAVIS.....	Pittsburg, Pa.
A. J. DAVIS.....	Chicago, Ill.
THOMAS DARLINGTON.....	New York City, N. Y.
W. A. EVANS.....	Chicago, Ill.
FRANK F. EDWARDS.....	New York, N. Y.
J. S. EVANS, JR.....	Philadelphia, Pa.
PERCIVAL J. EATON.....	Pittsburg, Pa.
R. P. ELDER.....	Columbus, O.
J. D. FREDRIKSEN.....	Little Falls, N. Y.
ARNOLD F. FURRER.....	Cleveland, O.
JOHN GUITERAS.....	Havana, Cuba.
EDWIN G. GOODSELL.....	Montclair, N. J.
GEORGE GOODHUE.....	Dayton, O.
CHAS. J. HASTINGS.....	Toronto, Canada.

The American Association of Medical Milk Commissions

ROSTER AT ATLANTIC CITY MEETING—Continued.

SAMUEL H. T. HAYES.....	Baltimore, Md.
J. M. HOUSTON.....	Philadelphia, Pa.
THOMAS W. HAVREY.....	Orange, N. J.
J. N. HURTY.....	Indianapolis, Ind.
J. O. HOWELLS.....	Bridgeport, Ohio.
A. CLARK HUNT.....	Metuchen, N. J.
MAXIMILIAN HERZOG.....	Chicago, Ill.
LUTHER M. HALSAY.....	Williamstown, N. J.
S. M. HEULINGS.....	Haddonfield, N. J.
SAMUEL MCC. HAMILL.....	Philadelphia, Pa.
H. W. HOAGLAND.....	Colorado Springs, Colo.
JOHN W. KERR.....	Washington, D. C.
MICHAEL KELLEY.....	Fall River, Mass.
BARNET JOSEPH.....	New York City, N. Y.
HENRY W. JEFFERS.....	Plainsboro, N. J.
C. B. LANE.....	Philadelphia, Pa.
WALTER W. LAW, JR.....	Briarcliff Manor, N. Y.
M. M. LUCID.....	Cortland, N. Y.
S. M. DELOFFRE.....	Columbus Barracks, Ohio.
ERNEST LACKNER.....	Chicago, Ill.
WALTER D. LUDLUM.....	Brooklyn, N. Y.
A. CLIFFORD MERCER.....	Syracuse, N. Y.
GEO. C. MOSHER.....	Kansas City, Mo.
WALLACE E. MILLER.....	Lebanon, O.
FLOY MCEWEN.....	Newark, N. J.
HARRIS MOAK.....	Brooklyn, N. Y.
HENRY T. MACHELL.....	Toronto, Canada.
ELIZA M. MOSHER.....	Brooklyn, N. Y.
ALBERT MERRELL.....	St. Louis, Mo.
D. J. MILTON MILLER.....	Atlantic City, N. J.
ALEX. MURRY, JR.....	Riverton, N. J.
CHARLES H. MINER.....	Wilkesbarre, Pa.
J. R. MOHLER.....	Washington, D. C.
FITCH C. E. MATTISON.....	Pasadena, Cal.
L. H. MCCLELLAND.....	Brooklyn, N. Y.
ARTHUR NEWLIN.....	Philadelphia, Pa.
BESSIE NEWSOM.....	Hot Springs, Ark.
CHARLES E. NORTH.....	New York City, N. Y.
B. FRANK OSWALD.....	Cleveland, O.
WILLIAM PORTER.....	St. Louis, Mo.
FRANCIS M. POTTENGER.....	Monrovia, California.
P. S. POTTER.....	North Adams, Mass.
RAYMOND A. PEARSON.....	Albany, N. Y.
WM. H. PARK.....	New York City, N. Y.
H. T. PRICE.....	Pittsburg, Pa.
C. S. PARKHILL.....	Hornell, N. Y.
WILBUR C. PHILIPS.....	New York City, N. Y.
GODFREY R. PISEK.....	New York City, N. Y.
ROBERT J. REED.....	Wheeling, W. Va.
M. J. ROSENAU.....	Washington, D. C.
H. R. RICHARDS.....	Easton, Pa.
R. S. ROWLAND.....	Detroit, Mich.
GEO. L. RICHARDS.....	Fall River, Mass.
J. N. REIK.....	Baltimore, Md.
S. FRANCISCO.....	Montclair, N. J.
S. J. S. FRANCISCO.....	Little Falls, N. J.

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ROSTER AT ATLANTIC CITY MEETING—Continued.

CHARLES H. SCRIBNER.....	Paterson, N. J.
WILL SHIMER.....	Indianapolis, Ind.
HENRY L. K. SHAW.....	Albany, N. Y.
ARTHUR STERN.....	Elizabeth, N. J.
GEO. C. SCHAEFFER.....	Columbus, O.
A. J. STEVENS.....	Malden, Mass.
S. M. SHOEMAKER.....	Eccleston, Md.
FRANCIS H. SLACK.....	Boston, Mass.
W. A. STOCKING, JR.....	Ithaca, N. Y.
WEBSTER S. SMITH.....	Dayton, O.
HAROLD E. STEARNS.....	Kearney, N. J.
J. P. SEDGWICK.....	Minneapolis, Minn.
W. H. SHALLCROSS.....	Pittsburg, Pa.
BRYAN D. SHEEDY.....	New York City, N. Y.
E. C. SCHROEDER.....	Bethesda, Md.
J. J. THOMAS.....	Cleveland, O.
GEO. W. TUTTLE.....	Pine Plains, N. Y.
FRANCIS H. TODD.....	Paterson, N. J.
FREDERIC W. TAYLOR.....	Cambridge, Mass.
PHILEMON E. TRUESDALE.....	Fall River, Mass.
THOMAS S. SOUTHWORTH.....	New York City, N. Y.
GEO. H. WALKER.....	Boston, Mass.
HENRY N. WOOLMAN.....	Philadelphia, Pa.
G. C. WATSON.....	Tully, N. Y.
HARRY R. WINTERS.....	Waverly, N. Y.
H. L. WOODWARD.....	Cincinnati, O.
ANDREW WILSON.....	Wheeling, W. Va.
JAMES WILSON.....	Wabash, Ind.
M. ROYAL WHITENACK.....	Newark, N. J.
C. G. YAEGER.....	Philadelphia, Pa.

The American Association of Medical Milk Commissions

CONSTITUTION AND BY-LAWS.

CONSTITUTION.

Article I. Name of the Association.

The name of this organization shall be "The American Association of Medical Milk Commissions."

Article II. Purposes of the Association.

The purpose of this Association shall be to federate and to bring into one compact association the Medical Milk Commissions of the United States; to exchange views and to adopt uniform methods of procedure in the work of the Medical Milk Commissions; to fix chemical and bacteriologic standards; to determine the scope of medical and veterinary inspections, and to foster and encourage the establishment of Medical Milk Commissions in other cities.

Article III. Membership.

Individual members of component Medical Milk Commissions, and those especially interested in dairy hygiene are eligible to full membership.

Article IV. Composition of the Conferences of this Association.

SECTION 1. The Conferences shall include members, delegates and guests.

Article V. Sessions and Meetings.

SECTION 1. The Association shall hold an annual session at a time and place to be fixed by the Council.

Article VI. Officers.

SECTION 1. The officers of this Association shall be a President, Secretary, and Treasurer, and a Council comprised of the executive officers and five other members.

SECTION 2. The officers shall be elected for a term of one year, and shall serve until their successors are elected and installed.

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SECTION 3. The Council shall be composed of the three executive officers and five additional members, all to be elected by the Association. The five additional members of the Council shall be elected for one, two, three, four, five years, respectively. Each year thereafter one member shall be elected annually for five years.

At each annual meeting the member of the Council who has served the longest as a member shall be elected chairman.

Article VII. Duties of Officers.

SECTION 1. The President.—It shall be the duty of the President to preside at all meetings of the Association except the meetings of the Council and the Standing Committees.

SECTION 2. The Secretary.—The Secretary shall conduct all correspondence of the Association, shall be the editor of the proceedings, which shall be issued in book or pamphlet form; shall arrange the details of the annual meetings under the direction of the Council; shall arrange and distribute programs of the annual meeting at least three weeks in advance of the meeting, and shall perform such other duties as are usually assigned to him.

SECTION 3. The Treasurer.—The Treasurer shall collect the annual dues from individual members of the Association in such amounts as may be fixed by the Council. He shall keep his account in bank in the name of the Association. He shall make an annual report to the Council of his receipts and disbursements, who shall submit it to a Committee of Auditing, and he shall pay out all moneys by check upon the receipt of a properly executed order or signed by the Secretary and President.

SECTION 4. Duties of the Council.—The Chairman of the council shall preside at the regular annual references of the Association in the absence of the President or upon the request of the President that he do so.

It shall be the duty of the Council to take charge of the business of the Association in the interim of its meetings; to make nominations for officers; to fill vacancies that occur between meetings; to publish the report of the proceedings; to fix the annual dues; to arrange for the program and order of business; to determine the time and place of meeting; to admit new Commissions; to nominate members and to invite guests. The Council shall elect its own Chairman and Secretary.

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If any paper presented at an annual meeting shall, in the judgment of the Council, misrepresent the work of the Association, it may so indicate to the Editor, who shall omit such matter from the transactions.

Article VIII. Funds and Expenses.

Funds for meeting the expenses of the Association shall be arranged for by the Council from the yearly dues to be fixed by the Council and by voluntary contributions.

Article IX. Amendments.

Amendments to this Constitution and By-Laws will be made by two-thirds vote of the delegates registered at any annual session, provided that such amendment shall have been presented in an open meeting at the annual session, and that it shall have been sent officially to each component Commission at least two months before the session at which final action is to be taken.

BY-LAWS.

Chapter I. Membership.

SECTION 1. All members of component Medical Milk Commissions and others elected for membership shall, on payment of dues described by the Council, become members, and shall be privileged to attend all meetings and take part in all the proceedings at the annual sessions, and may be elected to any office within the gift of the Association.

SECTION 2. Delegates.—Delegates shall be those members who are elected in accordance with this Constitution and By-Laws, to represent their respective component Medical Milk Commission at the annual meetings of this Association.

SECTION 3. Guests.—Any distinguished physician, educator in medical sanitation, or dairy hygienist may become a guest during any annual session, upon invitation of the Council, and shall be accorded the privilege of participating in all scientific work of that session.

Any component Commission may nominate a distinguished physician, educator in medical sanitation, or dairy hygienist to the Council to receive an invitation from that body to be a guest of

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the Association at its annual conference. These nominations must be in the hands of the Secretary of the Council at least two months in advance of the annual conference and through him the invitations issued if the Council approves.

SECTION 4. Each member in attendance at the annual session shall enter his name on registration card provided by the Secretary, indicating the component Commission of which he is a member, and whether or not he is a delegate. When his right to membership has been verified, he shall receive a badge, which shall be evidence of his right to all the privileges of his membership at that session.

No member or delegate shall take part in any of the discussions of the annual sessions until his dues have been paid and he has complied with the other provisions of this section.

Chapter II. Sessions.

SECTION 1. The Association shall hold an annual session, meeting at a point selected by the Council.

SECTION 2. Meetings of the Council shall be held the day previous to the annual session, at a time and place to be selected by the Chairman of the Council. The Chairman of the Council shall call a special meeting of the Council when petitioned to do so by five of its members.

Chapter III. General Meetings.

SECTION 1. General Meetings shall include all registered members and guests, who shall have the right to participate in the proceedings and discussions. Each general meeting shall be presided over by the President, or, in his absence or disability, or at his request, by the Chairman of the Council.

SECTION 2. Except by special vote, the order of business, papers and discussions, reports of committees, etc., as set forth in the program shall be followed until completed.

SECTION 3. No address or paper before the Association shall occupy more than fifteen minutes in its delivery, and no member shall speak longer than five minutes, nor more than once on any subject except by two-thirds vote of the members present.

SECTION 4. All papers read before the Association shall be its property and published in the annual volume of transactions.

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Chapter IV. Delegates.

SECTION 1. Each component Medical Milk Commission shall elect one delegate to the annual session. On the first afternoon of each annual session these delegates shall meet upon the call of the President for the purpose of electing the officers and the member of the Council for the ensuing year. They shall receive the nominations for these offices from the Council, and if these meet with approval, shall declare them elected. Nominations may be made from the floor of the meeting of delegates if desirable. No delegate is eligible to hold office in the Association.

SECTION 2. The majority of the registered delegates shall constitute a quorum.

SECTION 3. All elections shall be by secret ballot, and a majority of the votes cast shall be necessary to elect.

Chapter V. Committees.

Standing Committees of the Association shall be as follows:

Medical Examination of Employees.

Chemical Standards.

Bacteriological Standards.

Veterinary Inspections.

Chapter VI. Assessments and Expenditures.

SECTION 1. The annual dues of this Association shall be three dollars (\$3.00), or such sum in advance of this amount as may be decided by Council. The dues are payable at the regular annual meeting in advance for the coming year.

SECTION 2. No money shall be paid out by the Treasurer except on special order signed by the Secretary and the President.

Chapter VII. Amendments.

These By-Laws may be amended at any annual session by two-thirds vote of the members present at a session.

ADDENDA.

CONTRIBUTIONS TO THE SUBJECT OF CLEAN MILK.

- Conn.** "Bacteria in Milk and Its Products." Orange Judd Co., New York, 1907.
- Jensen.** "Essentials of Milk Hygiene." Translation by Pearson, J. B. Lippincott Co., Philadelphia, 1908.
- Leffman.** "Analysis of Milk and Milk Products."
- Sommerfeld.** "Handbuch der Milchkunde." J. F. Bergmann, Wiesbaden, Germany, 1909.
- Swithinbank
and
Newman.** "Bacteriology of Milk."
- Russell.** "Outlines of Dairy Bacteriology." H. L. Russell, Madison, Wis., 1907.
- Ward.** "Pure Milk and the Public Health." Taylor and Carpenter, Ithaca, N. Y., 1909.
- Ward and
Jaffa.** "Manual of Milk and Dairy Inspection."
- Winslow.** "The Production and Handling of Clean Milk." W. R. Jenkins, New York, 1907.

HYGIENIC LABORATORY BULLETINS.

- Bulletin No. 41. "Milk and Its Relation to the Public Health."
- Bulletin No. 42. "The Thermal Death Points of Pathogenic Micro-Organisms in Milk."

BUREAU OF ANIMAL INDUSTRY BULLETINS, REPRINTS AND CIRCULARS.

**U. S.
Depart-
ment
of
Agri-
culture.**

- Bulletin 104. "Medical Milk Commissions and the Production of CERTIFIED Milk in the United States."
- Circular No. 111. "Sanitary Relations of the Milk Supply." Commissioners of the District of Columbia.
- Circular No. 114. "Sanitary Milk Production." Commissioners of the District of Columbia.
- Circular No. 117. "A City Milk and Cream Contest as a Practical Method of Improving the Milk Supply."
- Circular No. 139. "The Score Card System of Dairy Inspection."
- Circular No. 142. "Some Important Factors in the Production of Sanitary Milk."
- Circular No. 143. "Milk and Its Products as Carriers of Tuberculosis Infection."
- "Market Milk: A Plan for Its Improvement."
- Bulletin No. 63. "Care of Milk on the Farm."
- Bulletin No. 74. "Milk as a Food."

ADDENDA—Continued.

- New York Milk Committee of the City of New York.** "Infant Milk Depots and Their Relation to Infant Mortality."
- American Association of Med. Milk Commissions.** "Proceedings of the First and Second Annual Meetings," "The Cincinnati Milk Show," by Dr. W. A. Evans, Health Commissioner of Chicago.
- Illinois Experiment Station, Urbana, Ill.** "Milk Supply of Chicago and Twenty-Six Other Cities." Bulletin No. 120.
- Storrs Agricultural Experiment Station, Storrs, Conn.** "The Covered Pail a Factor in Sanitary Milk Production." Bulletin No. 25.
 "Quality of Milk Affected by Common Dairy Practices." Bulletin No. 42.
 "Sources of Bacteria in Milk." Bulletin No. 51.
 "Improving Dairy Conditions." Bulletin No. 58.
- Tuley.** "Certified Milk and the General Supply of Louisville," H. E. Tuley, M. D. Journal of A. M. A., June, 1907.
- Howell.** "A Successful Demonstration of the Problem of Obtaining Sterile Cows' Milk," John T. Howell, M. D. Albany Medical Annals, March, 1909.
- Coit.** "A Plan to Procure Cows' Milk, Designed for Clinical Purposes."
 "Certified Milk." Archives of Pediatrics, Nov., 1897.
 "A Brief History of the Development of the Pure Milk Movement in the United States." International Congress "Les Gouttes de Lait," Brussels, Belgium, September, 1907.
 "Clean Milk and Its Economic and Medical Relations, with Special Reference to Certified Milk." Jefferson Co. Medical Society, Louisville, Ky., May, 1908.
 "A Method of Gathering Statistics of Milk Borne Morbidity and Mortality." Presidential Address A. A. M. M. C., June, 1908.
 "State Law in New Jersey Regulating Medical Milk Commissions." Text Published, April, 1909.
 "The Medical Commission: Its Origin, Its Purpose and Its Growth." Pediatric Section, XVIth International Medical Congress, Budapest, August, 1909.

NOTE.—All Bulletins, Circulars and Reprints mentioned in the above list may be had on application.

